REVISION HISTORY BG2T CHASSIS

MODEL

KV-HA21M80
KV-HA21N70
KV-HA21N80

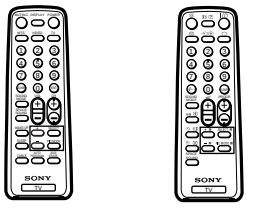
PART NO.: 9-872-280-01

NO.	SUFFIX	DATE	SUPP / CORR	DESCRIPTION
1	-01	2002/01	--	1st. Issue

Self Diagnosis
Supported model

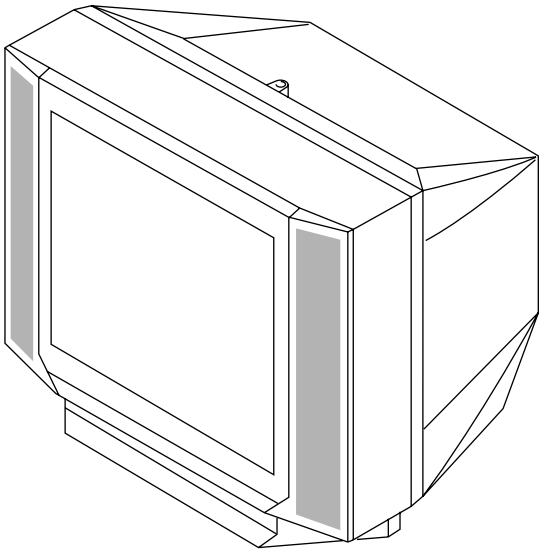
SERVICE MANUAL BG2T CHASSIS

MODEL	COMMANDER	DEST.	CHASSIS NO.	MODEL	COMMANDER	DEST.	CHASSIS NO.
KV-HA21M80	RM-969	India	SCC-U74C-A				
KV-HA21N70	RM-968	Philippines	SCC-U76D-A				
KV-HA21N80	RM-968	Philippines	SCC-U76C-A				



RM-968

RM-969



TRINITRON ® COLOR TV

SONY ®

SPECIFICATIONS

			Note
Power requirements	110-240 V AC, 50/60Hz		
Power consumption (W)	Indicated on the rear of the TV		
Television system	B/G, I, D/K, M		KV-HA21M80
	M		KV-HA21N70/HA21N80 only
Color system	PAL, PAL 60, SECAM, NTSC3.58, NTSC4.43		KV-HA21M80
	NTSC3.58, PAL*, PAL 60*, NTSC4.43*		*AN IN only (KV-HA21N70/HA21N80)
Channel coverage			
B/G	VHF: E2 to E12 UHF: E21 to E69 CATV: S01 to S03, S1 to S41		KV-HA21M80
I	UHF: B21 to B68 CATV: S01 to S03, S1 to S41		KV-HA21M80
D/K	VHF: C1 to C12, R1 to R12 UHF: C13 to C57, R21 to R60 CATV: S01 to S03, S1 to S41, Z1 to Z39		KV-HA21M80
M	VHF: A2 to A13 UHF: A14 to A79 CATV: A-8 to A-2, A to W+4, W+6 to W+84		KV-HA21M80
M	VHF: 2 to 13 UHF: 14 to 69 CATV: 1 to 125		KV-HA21N70/HA21N80 only
(Antenna)	75-ohm external terminal		
Audio output (Speaker)	5W + 5W		
Number of terminal			
Video	Input: 2* Output: 1	Phono jacks; 1 V_{P-P}, 75 ohms	* One input line available
Audio	Input: 2* Output: 1	Phono jacks; 500 mVrms	* One input line available
(Headphone)	Output: 1	Stereo minijack	except KV-HA21N70
(Earphone)	Output: 1	Monaural minijack	KV-HA21N70 only
Picture tube	21 in.		
Tube size (cm)	54		Measured diagonally
Screen size (cm)	51		Measured diagonally
Dimension (w/h/d, mm)	639 × 458 × 490		
Mass (kg)	26		

Design and specifications are subject to change without notice.

CAUTION

SHORT CIRCUIT THE ANODE OF THE PICTURE TUBE AND THE ANODE CAP TO THE METAL CHASSIS, CRT SHIELD, OR CARBON PAINTED ON THE CRT, AFTER REMOVING THE ANODE.

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY SHADING AND MARK ⚠ ON THE SCHEMATIC DIAGRAMS, EXPLODED VIEWS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

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SELF DIAGNOSTIC FUNCTION

The units in this manual contain a self-diagnostic function. If an error occurs, the STANDBY/TIMER lamp will automatically begin to flash.
The number of times the lamp flashes translates to a probable source of the problem. A definition of the STANDBY/TIMER lamp flash indicators is listed in the instruction manual for the user's knowledge and reference. If an error symptom cannot be reproduced, the remote commander can be used to review the failure occurrence data stored in memory to reveal past problems and how often these problems occur.

1. DIAGNOSTIC TEST INDICATORS

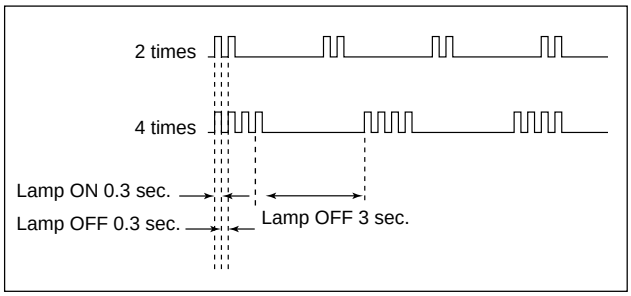
When an errors occurs, the STANDBY/TIMER lamp will flash a set number of times to indicate the possible cause of the problem. If there is more than one error, the lamp will identify the first of the problem areas.

Result for all of the following diagnostic items are displayed on screen. No error has occured if the screen displays a "0".

Diagnostic Item Description	No. of times STANDBY/TIMER lamp flashes	Self-diagnostic display/Diagnostic result	Probable Cause Location	Detected Symptoms
• Power does not turn on	Does not light	—	• Power cord is not plugged in. • Fuse is burned out F4601 (F)	• Power does not come on. • No power is supplied to the TV. • AC power supply is faulty.
• +B overcurrent (OCP) • Horizontal deflection overdrive	2 times	002:000 or 002:001~255	• H.OUT Q801 is shorted. (A board)	• Power does not come on. • Load on power line is shorted. • Has entered standby state after horizontal raster. • Power line is shorted or power supply is stopped.
• White balance failure (no PICTURE) • Vertical deflection stopped	4 times	004:000 or 004:001~225	• -13V is not supplied. (A board) • IC 551 faulty (A board)	• Vertical deflection pulse is stopped
• Micro reset	—	101:00 or 101:001~225	• Discharge CRT (CV Board) • Static discharge • External noise	• Power is shut down shortly, after this return back to normal. • Detect Micro latch up.

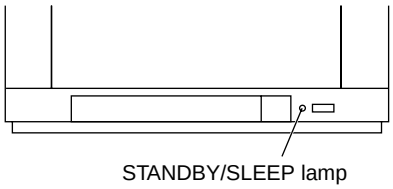
Note 1: If a + B overcurrent is detected, stoppage of the vertical deflection is detected simultaneously. The symptom that is diagnosed first by the microcontroller is displayed on the screen.
Note 2: Refer to screen (G2) Adjustment in section 3-4 of this manual.

2. DISPLAY OF STANDBY/TIMER LIGHT FLASH COUNT



Diagnostic Item	Flash Count*
+B overcurrent/overvoltage	2 times
Vertical deflection stopped	4 times

* One flash count is not used for self-diagnostic.



3. STOPPING THE STANDBY/TIMER FLASH

Turn off the power switch on the TV main unit or unplug the power cord from the outlet to stop the STANDBY/TIMER lamp from flashing.

4. SELF-DIAGNOSTIC SCREEN DISPLAY

For errors with symptoms such as “power sometimes shuts off” or “screen sometimes goes out” that cannot be confirmed, it is possible to bring up past occurances of failure for confirmation on the screen:

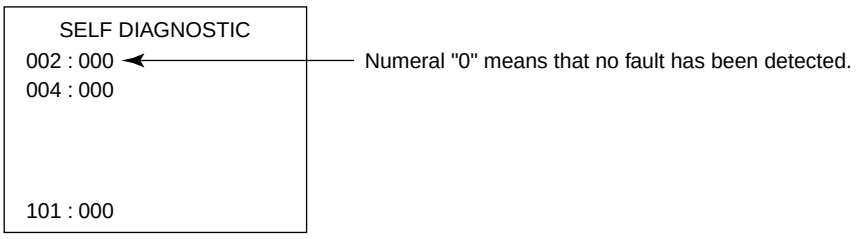
[To Bring Up Screen Test]
In standby mode, press buttons on the remote commander sequentially in rapid succession as shown below:

Screen display ➡ channel 5 ➡ Sound volume - ➡ Power ON

⇧

Note that this differs from entering the service mode (mode volume +).

Self-Diagnosis screen display



5. HANDLING OF SELF-DIAGNOSTIC SCREEN DISPLAY

Since the diagnostic results displayed on the screen are not automatically cleared, always check the self-diagnostic screen during repairs. When you have completed the repairs, clear the result display to “0”.

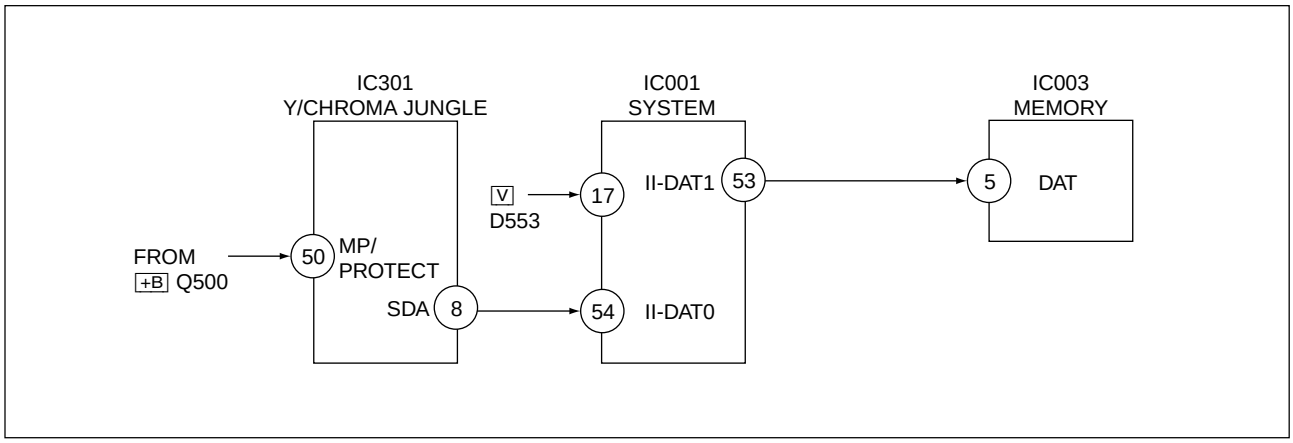
Unless the result display is cleared to “0”, the self-diagnostic function will not be able to detect subsequent faults after completion of the repairs.

[Clearing the result display]
To clear the result display to “0”, press buttons on the remote commander sequentially as shown below when the diagnostic screen is being displayed.

Channel [8] ➡ 0

[Quitting Self-diagnostic screen]
To quit the entire self-diagnostic screen, turn off the power switch on the remote commander or the main unit.

6. SELF-DIAGNOSTIC CIRCUIT



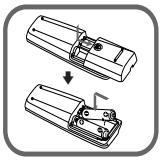
[+B overcurrent (OCP)]	Occurs when an overcurrent on the +B(135) line is detected by Q500. If Q500 go to ON and the voltage to pin 50 of IC301 more than 3.5V when V.SYNC is more than seven verticals in a period, the unit will automatically turn off.
[Vertical deflection stopped]	Occurs when an absence of the vertical deflection pulse is detected by Pin 17 and IC001 shut down the power supply.
[White balance failure]	If the RGB levels* do not balance or become low level within 5 seconds, this error will be detected by IC301. TV will stay on, but there will be no picture.

* (Refers to the RGB levels of the AKB detection Ref pulse that detects IK.)

The operating instruction mentioned here are partial abstracts from the Operating Instruction Manual. The page numbers of the Operating Instruction Manual remain as in the manual.

SECTION 1 GENERAL

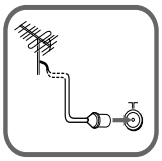
A Getting Started (KV-HA21N80/HA21N70)



Step 1

Insert the batteries (supplied) into the remote.

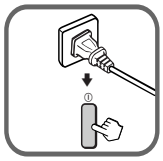
Note
- Do not use old batteries nor use different types of batteries together.



Step 2

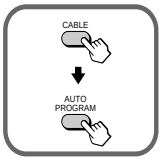
Connect the antenna cable (not supplied) to ⅂ (antenna input) at the rear of the TV.

Tip
- You can also connect your TV to other optional components. (See E)



Step 3

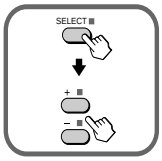
Plug in the power cord, then press ⏻ on the TV to turn it on.



Step 4

Press CABLE on the remote to select "CABLE: ON", then press AUTO PROGRAM on the remote to preset the channels automatically. (See J)

Tip
- To stop the automatic channel presetting, press SELECT.

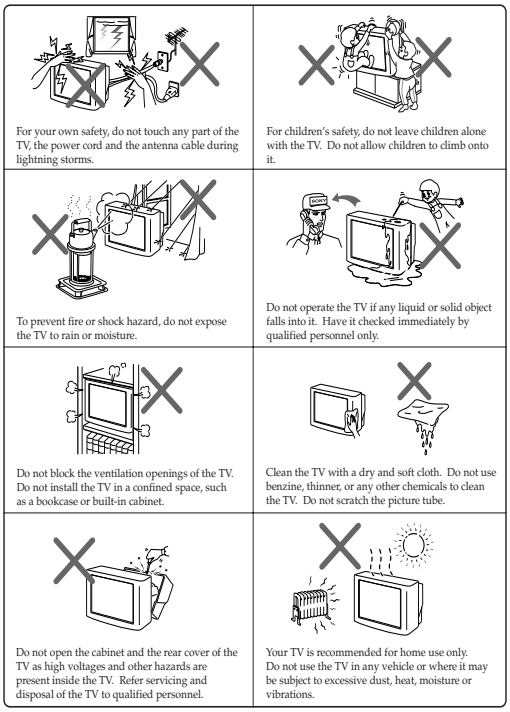


Step 5

Press SELECT on the remote until "LANGUAGE/語文顯示: ENGLISH" appears on the screen, then press + or – to change the on-screen display language.

B WARNING

- Dangerously high voltages are present inside the TV.
- TV operating voltage: 110 – 240 V AC.
- Do not plug in the power cord until you have completed making all other connections; otherwise a minimum leakage current might flow through the antenna and other terminals to ground.
- To avoid battery leakage and damage to the remote, remove the batteries from the remote if you are not going to use it for several days. If any liquid that leaks from the batteries touches you, immediately wash it away with water.



For your own safety, do not touch any part of the TV, the power cord and the antenna cable during lightning storms.

For children's safety, do not leave children alone with the TV. Do not allow children to climb onto it.

To prevent fire or shock hazard, do not expose the TV to rain or moisture.

Do not operate the TV if any liquid or solid object falls into it. Have it checked immediately by qualified personnel only.

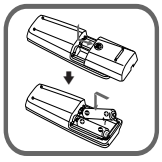
Do not block the ventilation openings of the TV. Do not install the TV in a confined space, such as a bookcase or built-in cabinet.

Clean the TV with a dry and soft cloth. Do not use benzine, thinner, or any other chemicals to clean the TV. Do not scratch the picture tube.

Do not open the cabinet and the rear cover of the TV as high voltages and other hazards are present inside the TV. Refer servicing and disposal of the TV to qualified personnel.

Your TV is recommended for home use only. Do not use the TV in any vehicle or where it may be subject to excessive dust, heat, moisture or vibrations.

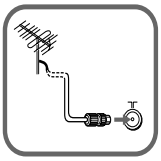
A Getting Started (KV-HA21M80)



Step 1

Insert the batteries (supplied) into the remote.

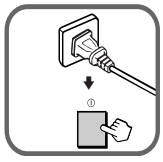
Note
- Do not use old batteries nor use different types of batteries together.



Step 2

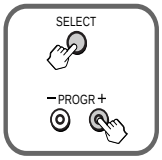
Connect the antenna cable (not supplied) to ⅂ (antenna input) at the rear of the TV.

Tip
- You can also connect your TV to other optional components. (See E)



Step 3

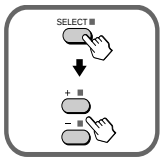
Plug in the power cord, then press ⏻ on the TV to turn it on.



Step 4

Press SELECT and PROGR + on the TV at the same time for one to two seconds to preset the channels automatically. (See J)

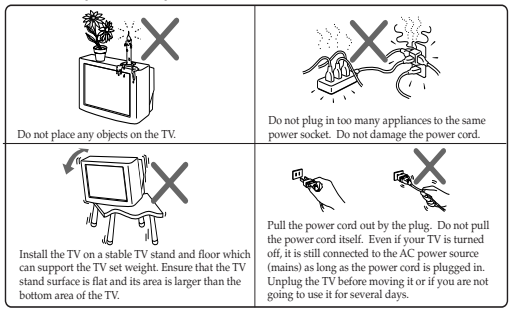
Tip
- To stop the automatic channel presetting, press SELECT.



Step 5

Press SELECT on the remote until "LANGUAGE/اللغة : ENGLISH" appears on the screen, then press + or – to change the on-screen display language.

WARNING (continued)



Do not place any objects on the TV.

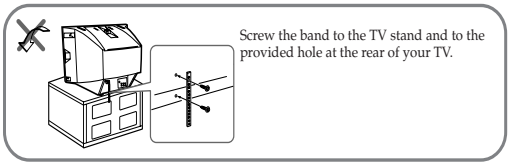
Do not plug in too many appliances to the same power socket. Do not damage the power cord.

Install the TV on a stable TV stand and floor which can support the TV set weight. Ensure that the TV stand surface is flat and its area is larger than the bottom area of the TV.

Pull the power cord out by the plug. Do not pull the power cord itself. Even if your TV is turned off, it is still connected to the AC power source (mains) as long as the power cord is plugged in. Unplug the TV before moving it or if you are not going to use it for several days.

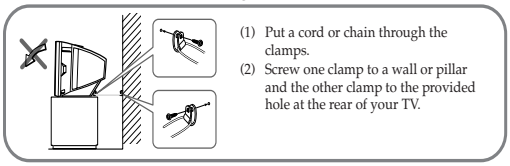
C Securing the TV

To prevent the TV from falling, use the supplied screws, clamps and band to secure the TV.



Screw the band to the TV stand and to the provided hole at the rear of your TV.

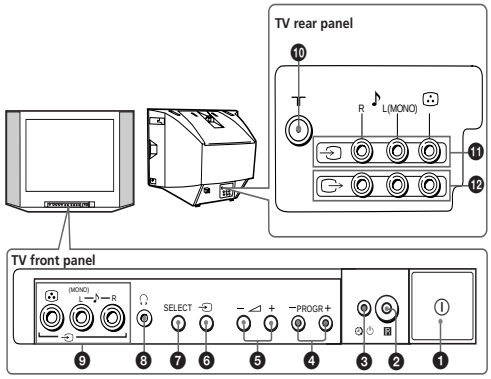
or



(1) Put a cord or chain through the clamps.
(2) Screw one clamp to a wall or pillar and the other clamp to the provided hole at the rear of your TV.

Note
- Use only the supplied screws. Use of other screws may damage the TV.

D TV front and rear panels

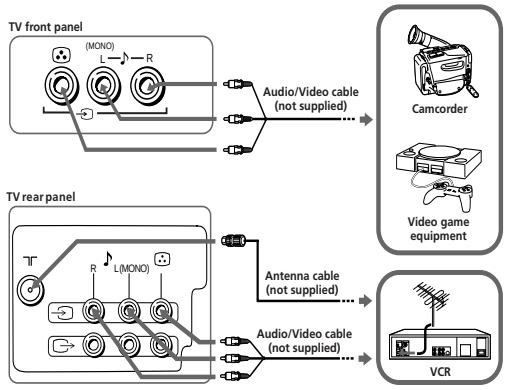


Button	Function
❶ ⏻	Turn off or turn on the TV.
❷ R	Remote control sensor.
❸ ⏻	Standby indicator.
❸ 🕘	Wake Up indicator.
❹ PROGR +/–	Select program number.
❺ ◿ +/– *	Adjust volume.
❻ ⊖	Select TV or video input.
❼ SELECT	Select the desired item.
❽ 🎧	Headphone terminal.
❾, ⓫ ⊖	Video input terminal.
❿ ⊤	Antenna input terminal.
⓬ ⊖	Monitor output terminal.

* You can also use the ◿ +/– buttons on the TV to work as the +/– buttons on the remote.

E Connecting optional components

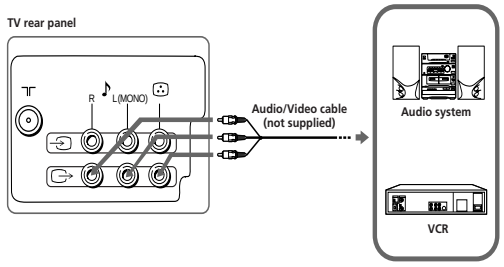
Connecting to the video input terminal (⊖)



Note

- Do not connect video equipment to ⊖ (video input) at the front and the rear of your TV at the same time; otherwise the picture will not be displayed properly on the screen.

Connecting to the monitor output terminal (⊖)

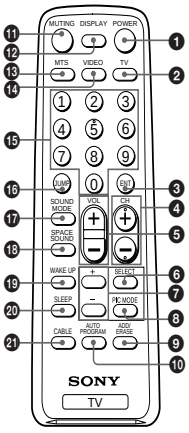


F Troubleshooting

If you find any problem while viewing your TV, please check the following guide. If any problem persists, contact your Sony dealer.

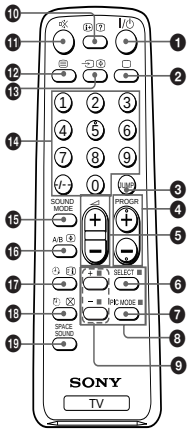
Symptom	Solutions
Snowy picture, noisy sound	• Check the antenna cable and connection on the TV, VCR and on the wall. • Preset the channel manually again. (See J) • Check the antenna setup. Contact a Sony dealer for advice.
Good picture, noisy sound	• Select the appropriate TV system. (See J)
No picture, no sound	• Check the power cord, antenna and the VCR connections. • Press I/⏻ (power) or ⏻ (main power) to turn on the TV.
Good picture, no sound	• Press ◿ + to increase the volume level. • Press 🔇 to cancel the muting.
Dotted lines or stripes	• Do not use a hair dryer or other equipment near the TV. • Check the antenna setup. Contact a Sony dealer for advice.
Double images or "ghosts"	• Use the fine tuning ("FINE") function. (See J) • Turn off or disconnect the booster if it is in use. • Check the antenna setup. Contact a Sony dealer for advice.
No color	• Select the appropriate color system. (See J) • Adjust the color level. (See K) • Check the antenna setup. Contact a Sony dealer for advice.
Abnormal color patches	• Keep external speakers or other electrical equipment away from the TV. Press ⏻ (main power) to turn off the TV for about 15 minutes, then turn it on again to demagnetize the TV.
The ⏻ (standby) indicator on your TV flashes red several times after every three seconds.	• Count the number of times the ⏻ (standby) indicator flashes. Press ⏻ (main power) to turn off your TV. Contact your nearest Sony service center.
TV cabinet creaks.	• Changes in room temperature sometimes make the TV cabinet expand or contract, making a noise. This does not indicate a malfunction.
A "boom" sound is heard when the TV is turned on.	• The TV's demagnetizing function is working. This does not indicate a malfunction.

H Remote control (KV-HA21N80/HA21N70)



Button	Function	See
❶ POWER	Turn off temporarily or turn on the TV.	–
❷ TV	Display the TV program.	–
❸ ENT	Confirm input number	–
❹ CH +/–	Select channel number.	–
❺ VOL +/–	Adjust volume.	–
❻ SELECT	Select the desired items.	–
❼ +/–	Adjust items.	–
❽ PIC MODE	Select picture mode.	K
❾ ADD/ERASE	Preset channels manually.	J
❿ AUTO PROGRAM	Preset channels automatically.	J
⓫ MUTING	Mute the sound.	–
⓬ DISPLAY	Display on-screen information.	–
⓮ VIDEO	Select TV or video input.	–
⓯ 0 – 9	Input numbers.	–
⓰ JUMP	Jump to previous channel number.	–
Timer operations		
⓳ WAKE UP	Set TV to turn on automatically.	I
⓴ SLEEP	Set TV to turn off automatically.	I
㉑ CABLE	Select the cable TV.	–
Sound mode operations (KV-HA21N80)		
⓱ SOUND MODE	Select sound mode.	K
⓲ SPACE SOUND	Select space sound mode.	K
⓭ MTS	Not function for your TV.	–

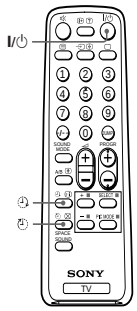
H Remote control (KV-HA21M80)



Button	Function	See
❶ I/⏻	Turn off temporarily or turn on the TV.	–
❷ ▢	Display the TV program.	–
❸ JUMP	Jump to previous program number.	–
❹ PROGR +/–	Select program number.	–
❺ ◿ +/–	Adjust volume.	–
❻ SELECT	Select the desired item.	–
❼ PIC MODE	Select picture mode.	K
❾ +/–	Adjust items.	–
❿ ⓘ	Display on-screen information.	–
⓫ 🔇	Mute the sound.	–
⓭ ⏀	Select TV or video input.	–
⓮ 0 – 9, -/--	Input numbers.	–
Timer operations		
⓱ ◴	Set TV to turn on automatically.	I
⓲ ◴	Set TV to turn off automatically.	I
⓯ SOUND MODE	Select sound mode.	K
⓰ SPACE SOUND	Select space sound mode.	K
⓬ A/B	Not function for your TV.	–
Teletext operations (green label)		
❽ ■ (red, green, yellow, blue)	Not function for your TV.	–
❿ ?		
⓬ ☰		
⓭ ⊕		
⓮ ⊕		
⓱ ⊟		
⓲ ⊗		

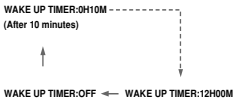
I Setting the timers (KV-HA21M80)

You can turn on and off your TV by using the ◴ and ◴ buttons respectively.



Setting the Wake Up timer

1 Press ◴ until the desired period of time appears on the screen.



The Wake Up timer starts immediately after you have set it.

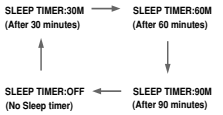
2 Select the program number or video input you want to wake up to.

3 Press I/⏻, or set the Sleep timer if you want the TV to turn off automatically.

The ◴ indicator on the TV lights up orange when the TV goes into standby mode.

Setting the Sleep timer

Press ◴ until the desired period of time appears on the screen.



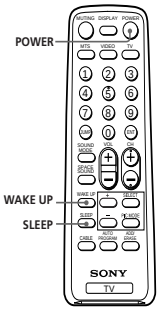
The Sleep timer starts immediately after you have set it.

Notes

- You can also cancel the Wake Up and Sleep timers by turning off the TV's main power.
- If no buttons or controls are pressed for more than two hours after the TV is turned on using the Wake Up timer, the TV automatically goes into standby mode.

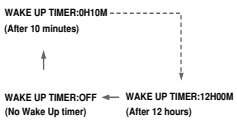
I Setting the timers (KV-HA21N80/HA21N70)

You can turn on and off your TV by using the WAKE UP and SLEEP buttons respectively.



Setting the Wake Up timer

1 Press WAKE UP until the desired period of time appears on the screen.



The Wake Up timer starts immediately after you have set it.

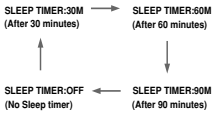
2 Select the program number or video input you want to wake up to.

3 Press POWER, or set the Sleep timer if you want the TV to turn off automatically.

The WAKE UP indicator on the TV lights up orange when the TV goes into standby mode.

Setting the Sleep timer

Press SLEEP until the desired period of time appears on the screen.



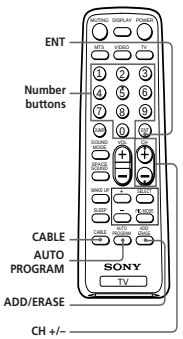
The Sleep timer starts immediately after you have set it.

Notes

- You can also cancel the Wake Up and Sleep timers by turning off the TV's main power.
- If no buttons or controls are pressed for more than two hours after the TV is turned on using the Wake Up timer, the TV automatically goes into standby mode.

J Presetting channels (KV-HA21N80/HA21N70)

You can automatically preset cable TV, VHF or UHF broadcast channels, or manually preset the channels to receive new channels or channels with a weak signal.



Presetting channels automatically

1 Press ⏻ on the TV to turn on the TV.

2 Press CABLE to select "CABLE: ON".

3 Press AUTO PROGRAM on the remote or press SELECT and CHANNEL + on the TV at the same time for one to two seconds to preset the channels automatically.

Presetting channels manually

1 Press the number buttons to select the desired channel number, then press ENT.

2 Press ADD/ERASE.

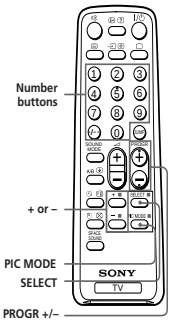
"+" appears beside the channel number, indicating that presetting is complete.

Notes

- If you select "CABLE: ON", you will be able to receive 125 cable TV channels. If there are no cable TV channels, you will receive VHF broadcast channels.
- If you select "CABLE: OFF ", you will be able to receive 68 VHF or UHF broadcast channels only.

J Presetting channels (KV-HA21M80)

You can automatically preset up to 100 TV channels in numerical sequence from program number 1, or manually preset desired channels and channels that cannot be preset automatically.



Presetting channels automatically from a specified program number

1 Press SELECT until "AUTO PROGRAM" appears on the screen.

2 Press + or – once to enter the "AUTO PROGRAM" mode.
The on-screen display will start flashing.

3 Press PROGR +/– or the number buttons until the desired program number appears on the screen.

4 Press + or – to start presetting channels automatically.

Presetting channels manually

1 Press SELECT until "MANUAL PROGRAM" appears on the screen.

2 Press + or – once to enter the "MANUAL PROGRAM" mode.

3 Press PROGR +/– or the number buttons until the desired program number appears on the screen.

4 Press + or – until the desired channel picture appears on the screen.

5 To preset other channels manually, repeat steps 3 to 4.

Presetting channels (continued) (KV-HA21M80)

To change the TV system setting

If the picture or sound is abnormal when receiving programs through the ⅂ (antenna input) terminal

(1) Press SELECT until "TV SYS" appears on the screen.

(2) Press + or – to select the appropriate TV system until the picture or sound quality is optimal.

B/G → I → D/K → M

To change the color system setting

If the color is abnormal when receiving programs through the ⅂ (antenna input) terminal or the ⇨ (video input) terminal

(1) Press SELECT until "COLOR SYS" appears on the screen.

(2) Press + or – to select the appropriate color system until the color is optimal.

AUTO → PAL → SECAM → NTSC3.58 → NTSC4.43

To skip program numbers

(1) Press PROGR +/– or the number buttons until the unused or unwanted program number appears on the screen.

(2) Press SELECT until "MANUAL PROGRAM" appears on the screen.

(3) Press + or – once to enter the "MANUAL PROGRAM" mode.

(4) Press PIC MODE to skip the unused or unwanted program number.

(5) Press SELECT to exit the "MANUAL PROGRAM" mode.

Note

• To restore the skipped program number again, preset the channel automatically or manually.

To use the fine tuning function

The fine tuning (FINE) function may help to reduce the following problems: double images and lines moving across the TV screen.

You can use the fine tuning function as below:

(1) Select the program number you want to adjust.

(2) Press SELECT until "MANUAL PROGRAM" appears on the screen.

(3) Press + or – once to enter the "MANUAL PROGRAM" mode.

(4) Press ⓕ to display "FINE" on the screen.

(5) Press + or – continuously until the above problems are minimized.
The + or – icon on the screen flashes while tuning.

(6) Press SELECT to exit the "MANUAL PROGRAM" mode.

Presetting channels (continued) (KV-HA21N80/HA21N70)

To change the color system setting

If the color is abnormal when receiving programs through the video input terminal.

(1) Press SELECT until "COLOR SYS" appears on the screen.

(2) Press + or – to select the appropriate color system until the color is optimal.

AUTO → PAL → NTSC3.58 → NTSC4.43

To skip program numbers

(1) Press CH +/– until the unused or unwanted channel number appears on the screen.

(2) Press ADD/ERASE to skip the unused or unwanted channel number.
"–" appears beside the channel number, indicating that disabling is complete.

Note

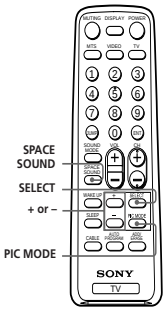
• To restore the skipped channel number again, preset the channel automatically or manually.

K Customizing the picture and sound

(KV-HA21N80/HA21N70)

You can customize the picture and sound by selecting the picture and sound modes or by adjusting its settings.

You can change the sound effect by selecting the space sound mode.



Selecting the picture mode

Press PIC MODE to select the desired picture mode.

Select	To
"DYNAMIC"	view high contrast pictures.
"STANDARD"	view normal contrast pictures.
"SOFT"	view mild pictures.

Selecting the sound mode

▶ **KV-HA21N80 only**

Press SOUND MODE to select the desired sound mode.

Select	To
"♪ DYNAMIC"	listen to dynamic and clear sound that emphasizes the low and high sound.
"♪ DRAMA"	listen to sound that emphasizes vocals and background music.
"♪ SOFT"	listen to soft sound.

Adjusting the picture and sound settings

1 Press SELECT until the desired setting appears.
Each time you press SELECT, the setting item will change as follows:

PICTURE → COLOR → BRIGHT → HUE → SHARP → BASS → TREBLE → BALANCE → PICTURE

2 Press + or – to adjust the item.

3 To adjust other items, repeat steps 1 to 2.

Notes

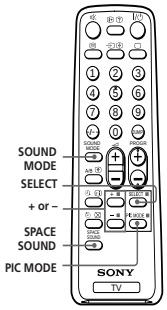
• "BASS", "TREBLE" and "BALANCE" can be adjusted for KV-HA21N80 only.
• "HUE" can be adjusted for the NTSC color system only.
• Reducing "SHARP" can also reduce picture noise.

K Customizing the picture and sound

(KV-HA21M80)

You can customize the picture and sound by selecting the picture and sound modes or by adjusting its settings.

You can change the sound effect by selecting the space sound mode.



Selecting the picture mode

Press PIC MODE to select the desired picture mode.

Select	To
"DYNAMIC"	view high contrast pictures.
"STANDARD"	view normal contrast pictures.
"SOFT"	view mild pictures.

Selecting the sound mode

Press SOUND MODE to select the desired sound mode.

Select	To
"♪ DYNAMIC"	listen to dynamic and clear sound that emphasizes the low and high sound.
"♪ DRAMA"	listen to sound that emphasizes vocals and background music.
"♪ SOFT"	listen to soft sound.

Adjusting the picture and sound settings

1 Press SELECT until the desired setting appears.

Each time you press SELECT, the setting item will change as follows:

PICTURE → COLOR → BRIGHT → HUE → SHARP → BASS → TREBLE → BALANCE → PICTURE

2 Press + or – to adjust the item.

3 To adjust other items, repeat steps 1 to 2.

Notes

- "HUE" can be adjusted for the NTSC color system only.
- Reducing "SHARP" can also reduce picture noise.

Selecting the space sound mode

Press SPACE SOUND.

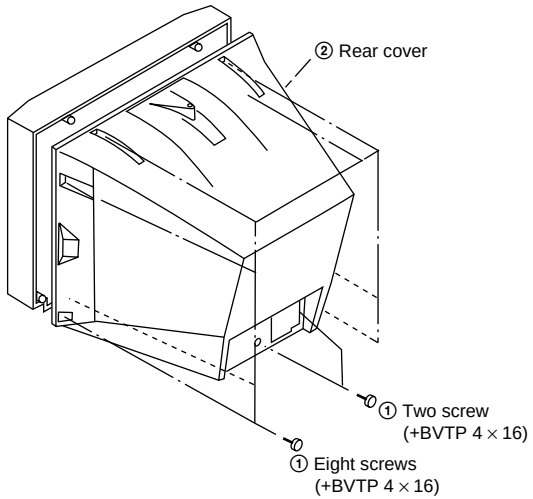
Select	To
"ON"	listen to monaural sound with a stereo-like effect.
"OFF"	turn off space sound mode.

Note

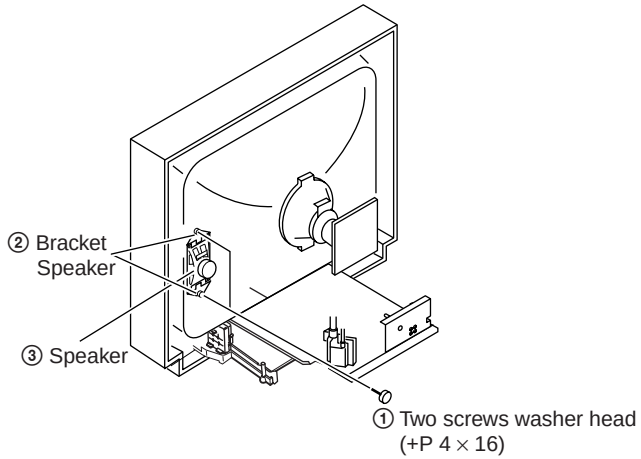
- You can also turn space sound on or off using the SELECT and + or – buttons.

SECTION 2
DISASSEMBLY

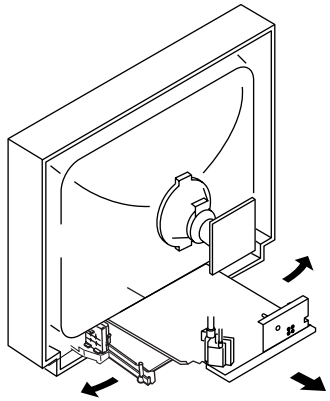
2-1. REAR COVER REMOVAL



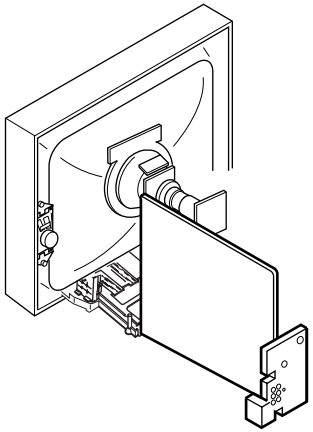
2-2. SPEAKER REMOVAL



2-3. CHASSIS ASSY REMOVAL



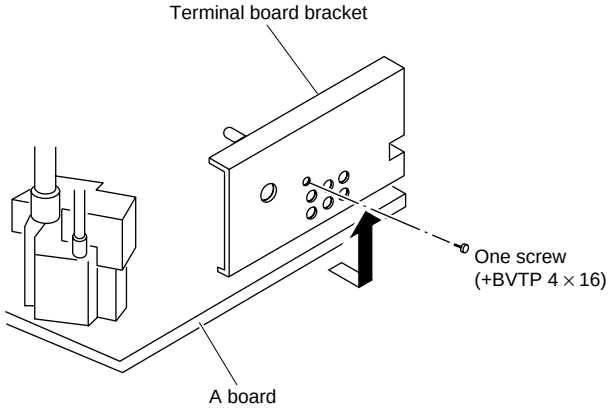
2-4. SERVICE POSITION



Caution: Do not take out CRT support block while TV set in standing position.

Note: Undress necessary wires that creates tension while placing the chassis into Service Position.

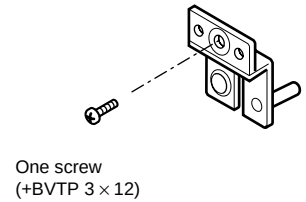
2-5. TERMINAL BRACKET REMOVAL



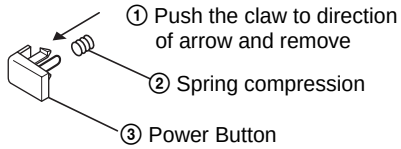
2-6. REPLACEMENT OF PARTS

For replacements of light guide,unscrew them, exchange with new parts and fix them with screws respectively.

2-6-1. Replacement of Light Guide



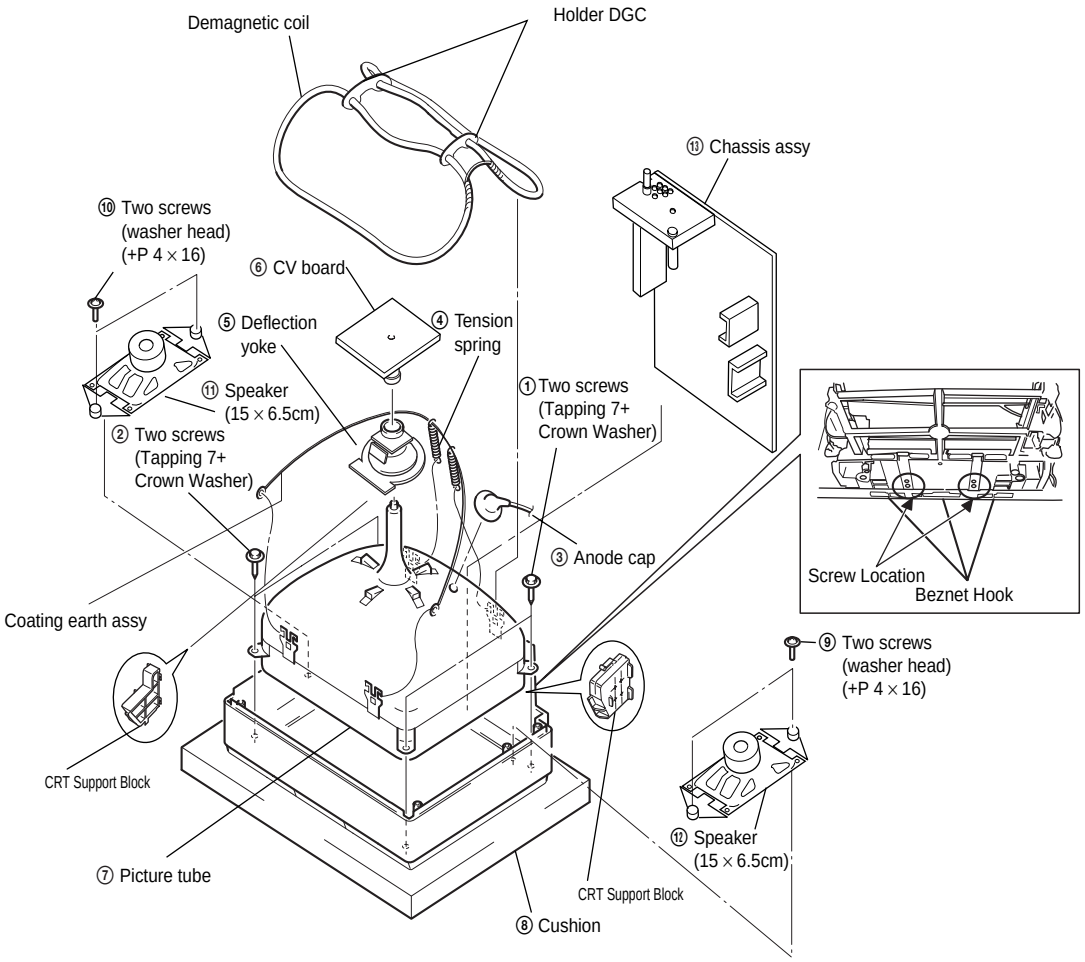
2-6-2. Replacement of Power Button



2-7. PICTURE TUBE REMOVAL

Note:

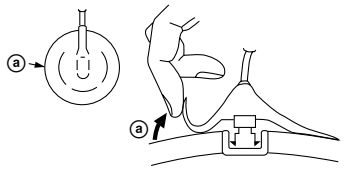
- Please make sure the TV set is not in standing position before removing necessary CRT support located on bottom right and left.


Demagnetic coil
Holder DGC
⑪ Chassis assy
⑩ Two screws (washer head) (+P 4 × 16)
⑥ CV board
⑤ Deflection yoke
④ Tension spring
⑪ Speaker (15 × 6.5cm)
② Two screws (Tapping 7+ Crown Washer)
① Two screws (Tapping 7+ Crown Washer)
③ Anode cap
Coating earth assy
Screw Location
Beznet Hook
⑨ Two screws (washer head) (+P 4 × 16)
CRT Support Block
⑫ Speaker (15 × 6.5cm)
⑦ Picture tube
CRT Support Block
⑧ Cushion

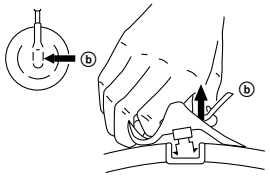
• REMOVAL OF ANODE-CAP

NOTE : After removing the anode, short circuit the anode of the picture tube and the anode cap to the metal chassis, CRT shield or carbon paint on the CRT.

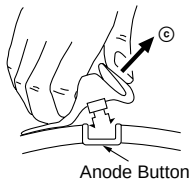
• REMOVING PROCEDURES



① **Turn up one side of the rubber cap in the direction indicated by the arrow ⓐ.**



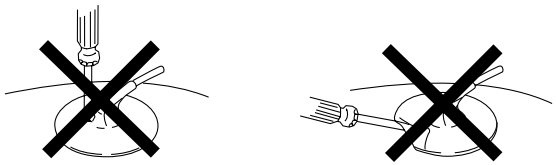
② **Using a thumb pull up the rubber cap firmly in the direction indicated by the arrow ⓑ.**



③ **When one side of the rubber cap is separated from the anode button, the anode-cap can be removed by turning up the rubber cap and pulling it up in the direction of the arrow ⓒ.**

- **HOW TO HANDLE AN ANODE-CAP**

① **Do not damage the surface of anode-caps with sharp shaped objects.**
② **Do not press the rubber too hard so as not to damage the inside of anode-cap. A metal fitting called the shatter-hook terminal is built into the rubber.**
③ **Do not turn the foot of rubber over too hard. The shatter-hook terminal will stick out or damage the rubber.**



SECTION 3
SET-UP ADJUSTMENTS

The following adjustments should be made when a complete realignment is required or a new picture tube is installed.

These adjustments should be performed with rated power supply voltage unless otherwise noted.

Controls and switches should be set as follows unless otherwise noted:

PICTURE control ..... normal
BRIGHTNESS control ..... normal

Perform the adjustments in the following order :

1. Beam Landing
2. Convergence
3. Focus
4. White Balance

Note : Test Equipment Required.

1. Pattern Generator
2. Degausser
3. Oscilloscope

Preparation :

In order to reduce the influence of geomagnetism on the set's picture tube, face it east or west.
Switch on the set's power and degauss with the degausser.

3-1. BEAM LANDING

1. Input a white signal with the pattern generator.
   Contrast } normal
   Brightness }
2. Set the pattern generator raster signal to a green raster.
3. Move the deflection yoke to the rear and adjust with the purity control so that the green is at the center and the blue and the red take up equally sized areas on each side. (See Figures 3-1 through 3-4.)
4. Move the deflection yoke forward and adjust so that the entire screen is green. (See Figure 3-1.)
5. Switch the raster signal to blue, then to red and verify the condition.
6. When the position of the deflection yoke has been decided, fasten the deflection yoke with the screws and DY spacers.
7. If the beam does not land correctly in all the corners, use a magnet to adjust it. (See Figure 3-4.)

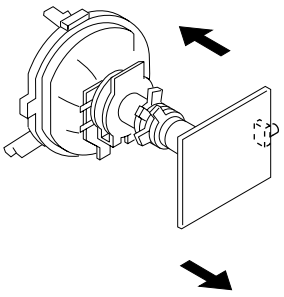


Fig. 3-1

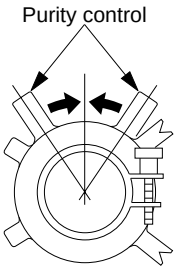


Fig. 3-2

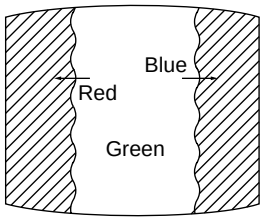


Fig. 3-3

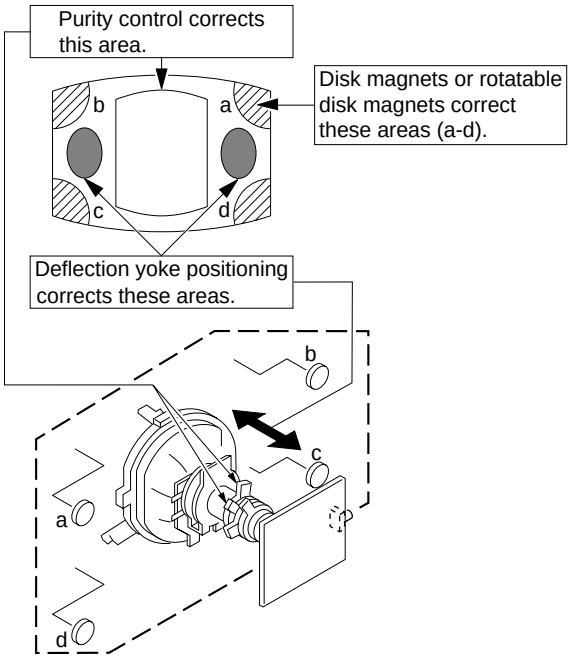


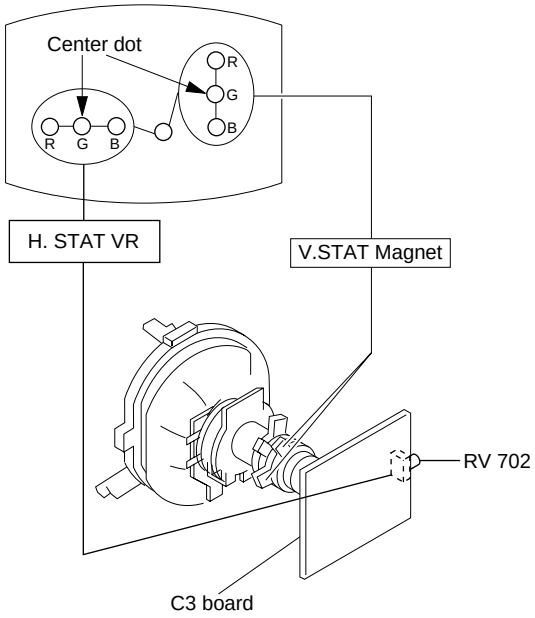
Fig. 3-4

3-2. CONVERGENCE

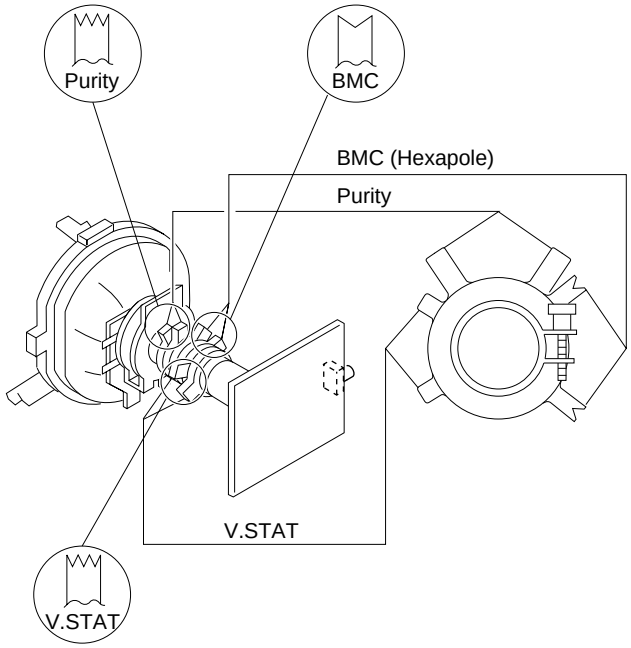
Preparation :

- Before starting this adjustment, adjust the focus, horizontal size and vertical size.
- Receive dot/hatch signal.
- Pic mode: Soft.

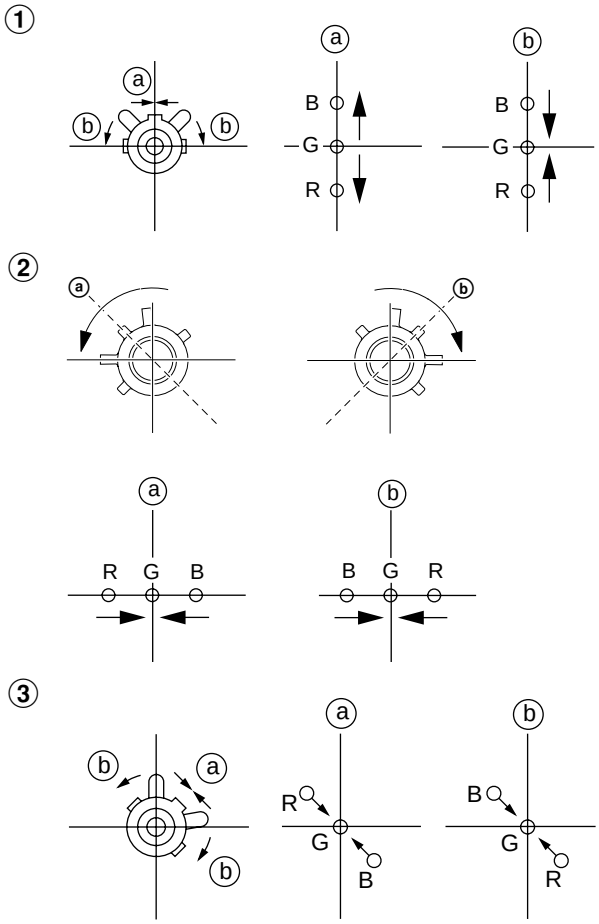
(1) Horizontal and Vertical Static Convergence



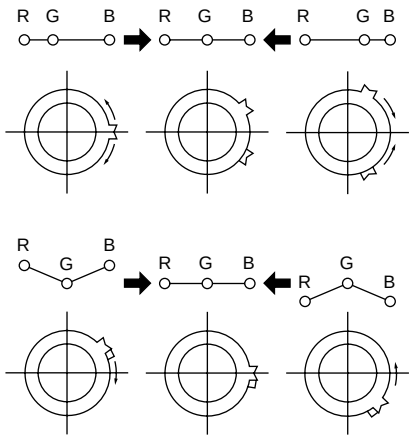
1. (Moving vertically), adjust the V.STAT magnet so that the red, green and blue dots are on top of each other at the center of the screen.
2. (Moving horizontally), adjust the H.STAT VR control so that the red, green and blue dots are on top of each other at the center of the screen.
3. If the H.STAT variable resistor cannot bring the red, green and blue dots together at the center of the screen, adjust the horizontal convergence with the H.STAT variable resistor and the V.STAT magnet in the manner given below.
   (In this case, the H.STAT variable resistor and the V.STAT magnet influence each other, so be sure to perform adjustments while tracking.)



- Operation of V. Stat magnet
  If the V. Stat magnet is moved in the "a" and "b" arrows, the red, green and blue dots move as shown below.



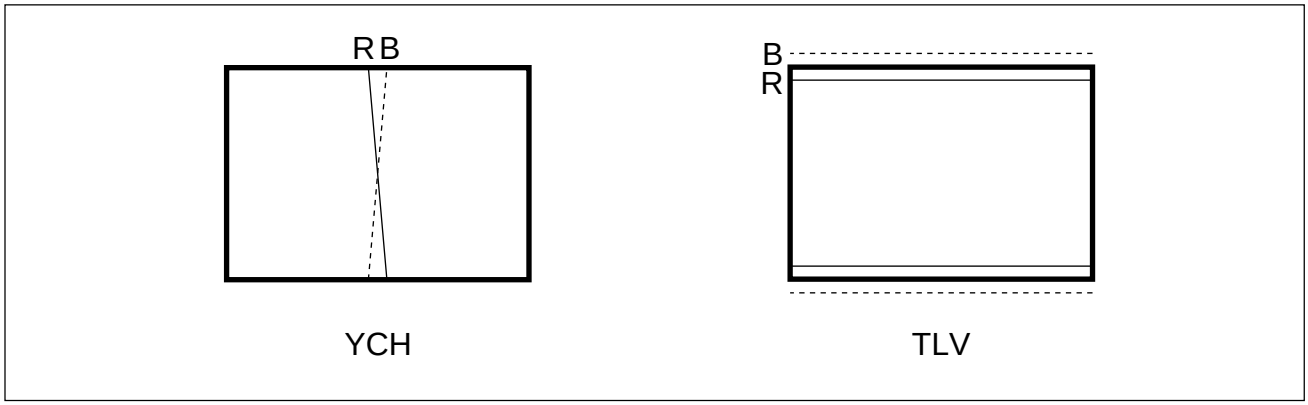
④ BMC (Hexapole) Magnet.
If the red, green and blue dots are not balanced or aligned, then use the BMC magnet to adjust in the manner described below.



(2) Dynamic Convergence Adjustment

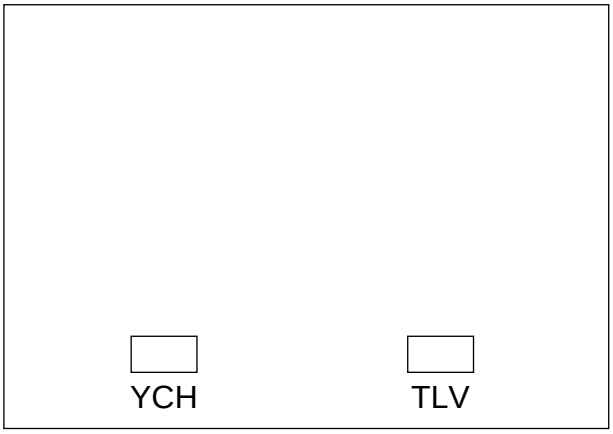
Preparation:

Before starting this adjustment, adjust the horizontal static convergence and the vertical static convergence

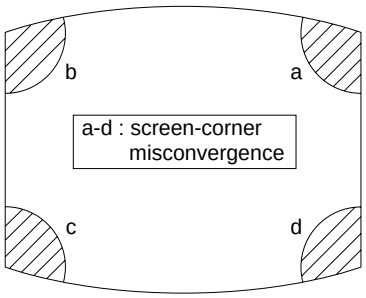


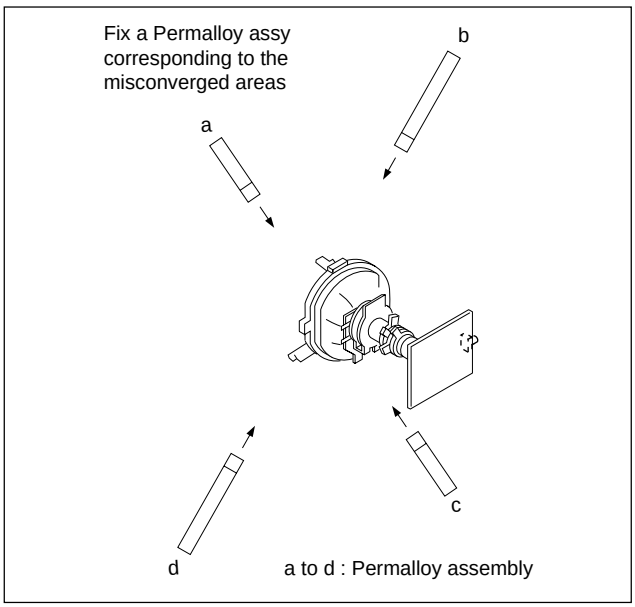
TLH	Insert	TLH	Correction Plate to DY Pocket (Left or Right)
YCH	Rotate	YCH	VOL on DY
TLV	Rotate	TLV	VOL ON DY
XCV	Rotate	XCV	Adj core on DY

ON DY:



(3) Screen-corner Convergence

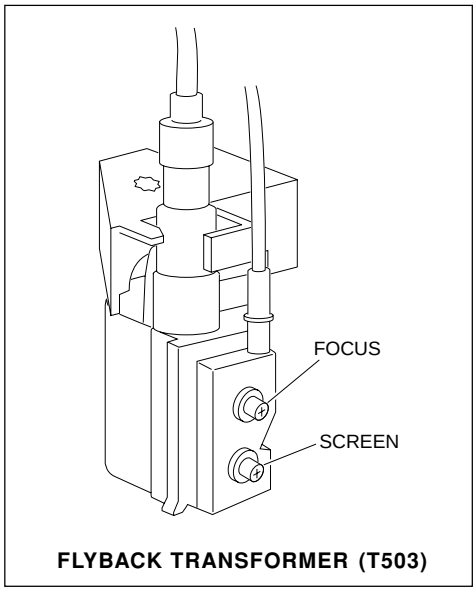




3-3. FOCUS ADJUSTMENT

FOCUS adjustment should be completed before W/B adjustment.

1. Receive digital monoscope pattern.
2. Set "Picture Mode" to "DYNAMIC".
3. Adjust focus VR so that the center of screen becomes just focus.
4. Change the receiving signal to white pattern and blue back.
5. Confirm magenta ring is not noticeable. Incase magenta is very obvious, adjust focus VR to take balance of magenta ring and focus.

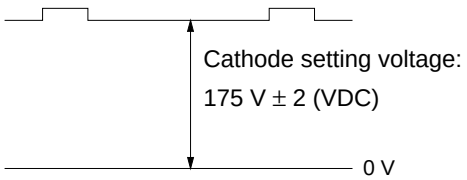


FLYBACK TRANSFORMER (T503)

3-4. G2 (SCREEN) AND WHITE BALANCE ADJUSTMENTS

1. G2 (SCREEN) ADJUSTMENT

1) Set the PICTURE to normal.
2) Put to VIDEO input mode without signals.
3) Connect R, G and B of the C board cathode to the oscilloscope.
4) Adjust BRIGHTNESS to obtain the cathode voltage to the value below.
5) Adjust G2 (screen) on the FBT until picture shows the point before cut off.

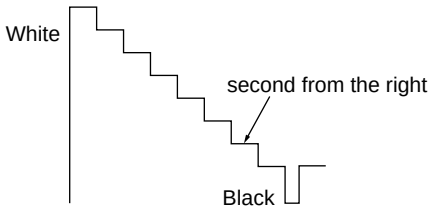


2.a) WHITE BALANCE ADJUSTMENT

1) Set to Service Mode (Refer Section 4-1: ADJUSTMENTS WITH COMMANDER).
2) Input white raster signal.
3) Set 49 (ABL) and IF (VP2) service mode to 00.
4) Set Picture to DYNAMIC.
5) Select OB (RDR) with [1] and [4], and set the level to 25 with [3] and [6] for best white balance.
6) Select OC 'GDR' and OD 'BDR' with [1] and [4], and adjust the level with [3] and [6] for the best white balance.
7) Write into the memory by pressing [MUTING] then [0].
8) Set back 49 'ABL' and IF 'VP2' service mode to original data.

2.b) SUB BRIGHT ADJUSTMENT

1) Set to service mode.
2) Set 49(ABL) and IF (VP2) service mode to 00
3) Input a staircase signal of black to white from the pattern generator.
4) BRIGHTNESS .... 50%.
   PICTURE ..... MINIMUM
5) Select OE 'SBR' with [1] and [4], and adjust OE 'SBR' level with [3] and [6] so that the second stripe from the right is dimly lit.
6) Write into the memory by pressing [MUTING] then [0].
7) Set back 49 (ABL) and IF (VP2) service mode to original data.



SECTION 4
CIRCUIT ADJUSTMENTS

4-1. ADJUSTMENT WITH COMMANDER

Service adjustments to this model can be performed using the supplied Remote Commander RM-968 and RM-969.

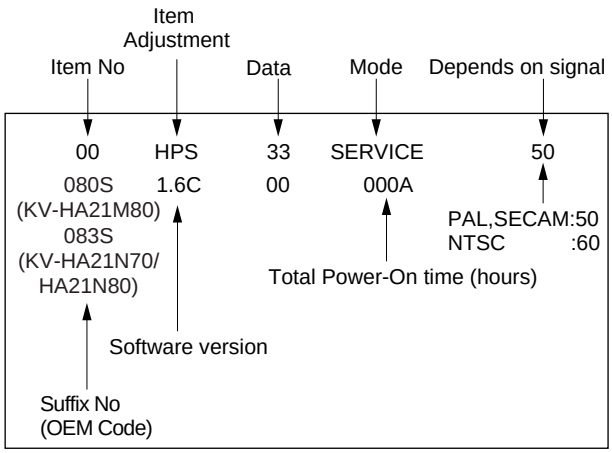
a. ENTERING SERVICE MODE

With the unit on standby

→ [DISPLAY] → [5] → [VOL (+)] → [POWER]

This operation sequence puts the unit into service mode.

The screen display is :



b. METHOD OF CANCELLATION FROM SERVICE MODE

Set the standby condition (Press [POWER] button on the commander), then press [POWER] button again, hereupon it becomes TV mode.

c. METHOD OF WRITE INTO MEMORY

1) Set to Service Mode.
2) Press [1] (UP) and [4] (DOWN), to select the adjustment.
4) Press [MUTING] button to indicate WRITE on the screen.
5) Press [0] button to write into memory.

d. MEMORY WRITE CONFIRMATION METHOD

1) After adjustment, pull out the plug from AC outlet, and then plug into AC outlet again.
2) Turn the power switch ON and set to Service Mode.
3) Call the adjusted items again to confirm adjustments were made.

[1], [4]	Select the adjustment item.
↓	
[3], [6]	Raise/lower the data value.
↓	
[MUTING]	Writes.
↓	
[0]	Executes the writing.

e. OTHER FUNCTION VIA REMOTE COMMANDER

[7], [0]	All the data becomes the values in memory.
[8], [0]	All user control goes to the standard state.
[5], [0]	Service data initialization (Be sure not to use usually.)
[2], [0]	Copy and write all data.
[MUTE], [0]	Write 50Hz adjustment data to 60Hz or vice versa.

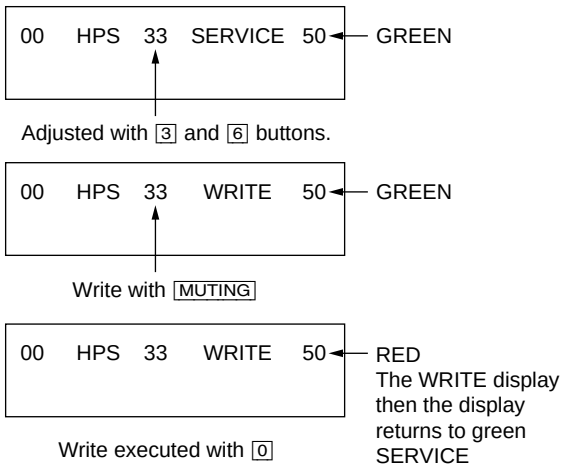
4-2. ADJUSTMENT METHOD

Item Number 00 HPS

This explanation uses H Shift as an example.

1. Select “00 HPS” with the [1] and [4] buttons.
2. Raise/lower the data with the [3] and [6] buttons.
3. Select the optimum state. (The standard is 1F for PAL reception.)
4. Write with the [MUTING] button. (The display changes to WRITE.)
5. Execute the writing with the [0] button. (The WRITE display will be changed to red color while excuting, and back to SERVICE.)

Example on screen display :-


00 HPS 33 SERVICE 50
GREEN
Adjusted with 3 and 6 buttons.
00 HPS 33 WRITE 50
GREEN
Write with MUTING
00 HPS 33 WRITE 50
RED
The WRITE display then the display returns to green SERVICE
Write executed with 0

Use the same method for all Items. Use [1] and [4] to select the adjustment item, use [3] and [6] to adjust, write with [MUTING], then execute the write with [0].

Note : 1. In [WRITE], the data for all items are written into memory together.
2. For adjustment items that have different standard data between 50Hz or 60Hz, be sure to use the respective input signal after adjustment.

Adjustment Item Table (KV-HA21M80)

Functionality No.	Functionality Name	Init.	Range	Function	Table & Note	Register No. (Bit Range)	Device Name (Slave Address)
00	HPS	2A	3F	H Position	50/60Hz	03 (5-0)	TDA8843/44(8A)
01	HSZ	1F	3F	H Size	50/60Hz	04 (5-0)	
02	PAP	1F	3F	Pin Amplitude	50/60Hz	05 (5-0)	
03	CPN	1F	3F	Corner Pin	50/60Hz	06 (5-0)	
04	TLT	1F	3F	Tilt	50/60Hz	07 (5-0)	
05	VSL	26	3F	V Slope	50/60Hz	08 (5-0)	
06	VAP	0F	3F	V Amplitude	50/60Hz	09 (5-0)	
07	SCO	0F	3F	S Correction	50/60Hz	0A (5-0)	
08	VPS	1F	3F	V Shift	50/60Hz	0B (5-0)	
09	VZM	19	3F	Vertical Zoom		16 (5-0)	
0A	VSC	1F	3F	Vertical Scroll	50/60Hz	17 (5-0)	
0B	RDR	1F	3F	R Drive	Dynamic/Others	0C (5-0)	
0C	GDR	25	3F	G Drive	Dynamic/Others	0D (5-0)	
0D	BDR	25	3F	B Drive	Dynamic/Others	0E (5-0)	
0E	SBR	58	7F	Sub Brightness		10 (5-0)	
0F	PMX	20	3F	Picture Maximum Data	TV/Video/Teletext	12 (5-0)	
10	PMI	04	3F	Picture Minimum Data		12 (5-0)	
11	SHU	07	0F	Sub Hue	TV/Video	02 (5-0)	
12	SSH	01	03	Sub Sharpness	TV/Video	0F (5-0)	
13	SC1	20	3F	Sub Color Lower	50/60Hz	11 (5-0)	
14	SC2	08	3F	Sub Color Higher	50/60Hz	11 (5-0)	
15	FO	00	03	01 Time Constant	TV/Video/Teletext	00 (3-2)	
16	AGT	00	3F	AGC Take Over	TV/Video/Teletext	13 (5-0)	
17	VSW	00	01	Video Mute Switch	TV/Video/Teletext	13 (6)	
18	FOR	03	03	Forced Field Frequency		01 (7-6)	
19	DL	00	01	De-interlace		01 (5)	
1A	POC	00	01	Fixed 01 Synchro. Mode		01 (3)	
1B	COR	01	01	Noise Coring	TV/Video/Teletext	10 (6)	
1C	RBL	00	01	RGB Blanking	TV/Video/Teletext	10 (7)	
1D	YDL	0A	0F	Y-Delay	PAL/NTSC/SECAM	1A (7-4)	
1E	VP1	00	FF	Extra Bits (see specified pages)			
1F	VP2	01	FF	Extra Bits (see specified pages)			
20	VP3	0F	FF	Extra Bits (see specified pages)			
21	WST	15	FF	W/G Stereo Threshold			MSP3417G(80)
22	WBT	EC	FF	W/G Bilingual Threshold			
23	WLL	05	FF	W/G Monaural Threshold			
24	WAC	01	0F	W/G Agreement Count			
25	WDL	30	FF	W/G Search Delay			
26	NDL	20	FF	NICAM Search Delay			
27	SDL	10	FF	Stereo Status Read Delay			
28	AGC	01	01	AGC Switch auto/constant		BB (7)	
29	REL	28	3F	AGC Gain at Constant Mode		BB (6-1)	
2A	CRM	00	01	Carrier Muting on/off		BB (9)	
2B	ACO	01	01	Audio Clock-out on/off		83 (5)	
2C	FP	1B	7F	FM Prescale for B/G, I, D/K		0E (7-0)	
2D	FPM	32	7F	FM Prescale for M		0E (7-0)	
2E	FH	36	7F	FM Prescale for HDEV (non-M)		0E (7-0)	
2F	FHM	65	7F	FM Prescale for HDEV (M)		0E (7-0)	

Adjustment Item Table

Functionality No.	Functionality Name	Init.	Range	Function	Table & Note	Register No. (Bit Range)	Device Name (Slave Address)
30	WGP	1C	7F	W/G Prescale		0E (7-0)	
31	NIP	7F	7F	NICAM Prescale		10 (7-0)	
32	ERR	50	FF	Auto FM Switch Threshold		21 (10-3)	
33	VOL	6D	7F	DFP Volume Maximum		00 (14-8)	
34	ING	00	0F	Input Gain	M System/non-M/Video	01 (3-0)	TDA7438(88)
35	VOM	00	3F	Volume Output Gain	M System only	02 (5-0)	
36	BCS	01	03	Bass Center Shift			
37	TCS	02	03	Treble Center Shift			
38	TXH	2A	FF	Horizontal Display Position			SAA5264(58)
39	TXV	27	3F	Vertical Display Position (line offset from V-sync)			
3A	THD	00	7F	H-sync Active Edge Shift			
3B	TVD	3F	7F	V-sync Active Edge Shift			
3C	HPL	01	01	H-sync Polarity Configuration	00 : Positive, 01 : Negative		
3D	VPL	01	01	V-sync Polarity Configuration	00 : Positive, 01 : Negative		
3E	FPL	01	01	Field Polarity Configuration	00 : V-sync second half line, 01 : V-sync first half line		
3F	FMD	00	03	Force Mode	00 : Auto, 01 : Default, 02 : Fastext, 03 : Top Mode		
40	TBR	08	0F	Set Teletext RGB Brightness			
41	NOP	01	0F	National Option Table Configuration			
42	TCH	01	03	Twisted Character Set Configuration			
43	BKP	00	3F	Picture Data at Blanking OFF			Other Control
44	ODL	10	FF	Power ON Delay			
45	OSH	0A	3F	OSD H Position			
46	TSY	00	03	TV System at Auto Preset	00 : B/G, 01 : I, 02 : D/K, 03 : M		
47	DKS	01	01	D/K Stereo enable/disable			
48	MUT	00	01	Muting on/off at No Sync			
49	ABL	01	01	Bright ABL Switch			
4A	SCM	01	01	SECAM Trap active/inactive			
4B	SLS	01	01	Activate SL.OR.IFI Sync			
4C	SSV	02	07	Space Sound Volume Step Up			
4D	VPW	35	7F	Timer of Video Processor start up wait			
4E	OP1	2F	FF	Optional Flags 0 (see specified pages)			
4F	OP2	0F	FF	Optional Flags 1 (see specified pages)			
50	OP3	00	FF	Optional Flags 2 (see specified pages)			

NOTE

- Standard data listed on the Adjustment Item Table are reference values, therefore it may be different for each model and for each mode.
- Note for Different Data Those are the standard data values written on the microprocessor. Therefore, the data values of the modes and stored respectively in the memory.
  In case of a device replacement, adjustment by rewriting the data value is necessary for some items.

Adjustment Item Table (KV-HA21N80/N70)

Functionality		Init.	Range	Function	Table & Note	Register No. (Bit Range)	Device Name (Slave Address)
No.	Name						
00	HPS	24	3F	H Shift	50/60Hz	03 (5-0)	TDA8843/44(8A)
01	HSZ	23	3F	H Size	50/60Hz	04 (5-0)	
02	PAP	21	3F	Pin Amplitude	50/60Hz	05 (5-0)	
03	CPN	29	3F	Corner Pin	50/60Hz	06 (5-0)	
04	TLT	20	3F	Tilt	50/60Hz	07 (5-0)	
05	VSL	20	3F	V Slope	50/60Hz	08 (5-0)	
06	VAP	1D	3F	V Amplitude	50/60Hz	09 (5-0)	
07	SCO	20	3F	S Correction	50/60Hz	0A (5-0)	
08	VPS	20	3F	V Shift	50/60Hz	0B (5-0)	
09	VZM	19	3F	Vertical Zoom		16 (5-0)	
0A	VSC	20	3F	Vertical Scroll	50/60Hz	17 (5-0)	
0B	RDR	25	3F	R Drive	Dynamic/Others	0C (5-0)	
0C	GDR	25	3F	G Drive	Dynamic/Others	0D (5-0)	
0D	BDR	25	3F	B Drive	Dynamic/Others	0E (5-0)	
0E	SBR	4B	7F	Sub Brightness		10 (5-0)	
0F	PMX	27	3F	Picture Maximum Data	TV/Video/Teletext	12 (5-0)	
10	PMI	05	3F	Picture Minimum Data		12 (5-0)	
11	SHU	05	0F	Sub Hue	TV/Video	02 (5-0)	
12	SSH	01	03	Sub Sharpness	TV/Video	0F (5-0)	
13	SC1	1F	3F	Sub Color Lower	50/60Hz	11 (5-0)	
14	SC2	0B	3F	Sub Color Higher	50/60Hz	11 (5-0)	
15	FO	00	03	01 Time Constant	TV/Video/Teletext	00 (3-2)	
16	AGT	30	3F	AGC Take Over	TV/Video/Teletext	13 (5-0)	
17	VSW	00	01	Video Mute Switch	TV/Video/Teletext	13 (6)	
18	FOR	00	03	Forced Field Frequency		01 (7-6)	
19	DL	00	01	De-interlace		01 (5)	
1A	POC	00	01	Fixed 01 Synchro. Mode		01 (3)	
1B	COR	00	01	Noise Coring	TV/Video/Teletext	10 (6)	
1C	RBL	00	01	RGB Blanking	TV/Video/Teletext	10 (7)	
1D	YDL	08	0F	Y-Delay	PAL/NTSC/SECAM	1A (7-4)	
1E	VP1	00	FF	Extra Bits (see specified pages)			
1F	VP2	01	FF	Extra Bits (see specified pages)			
20	VP3	08	FF	Extra Bits (see specified pages)			
21	ING	00	0F	Input Gain	M System/non-M/Video	01 (3-0)	TDA7438 (88)
22	VOM	01	3F	Volume Output Gain	M System only	02 (5-0)	
23	BCS	01	03	Bass Center Shift			
24	TCS	01	03	Treble Center Shift			
25	BKP	00	3F	Picture Data at Blanking OFF			Other Control
26	ODL	10	FF	Power ON Delay			
27	OSH	0A	3F	OSD H Position			
28	TSY	00	03	TV System at Auto Preset	00: B/G, 01: I, 02: D/K, 03: M		
29	DKS	01	01	D/K Stereo enable/disable			
2A	MUT	00	01	Muting on/off at No Sync			
2B	ABL	00	01	Bright ABL Switch			
2C	SCM	00	01	SECAM Trap active/inactive			
2D	SLS	00	01	Activate SL. OR. IFI Sync			
2E	SSV	02	07	Space Sound Volume Step Up			
2F	VPW	28	7F	Timer of Video Processor start up wait			

Adjustment Item Table (KV-HA21N80/N70)

Functionality		Init.	Range	Function	Table & Note	Register No. (Bit Range)	Device Name (Slave Address)
No.	Name						
30	SCA	01	01	Shipping Condition of Cable on/off			
31	SCH	01	7F	Shipping Condition of Channel Number			
32	OP1	2F	FF	Option Flag 0 (see below)			
33	OP2	0F	FF	Option Flag 1 (see below)			
34	OP3	00	FF	Option Flag 2 (see below)			

NOTE

- Standard data listed on the Adjustment Item Table are reference values, therefore it may be different for each model and for each mode.
- Note for Different Data Those are the standard data values written on the microprocessor. Therefore, the data values of the modes and stored respectively in the memory.
  In case of a device replacement, adjustment by rewriting the data value is necessary for some items.

ITEM INFORMATION (KV-HA21M80)

No. 1E VP1

Item	-	-	BCO	OSO	SBL	HBL	FCO	FFI
KV-HA21M80	0	0	0	0	0	0	0	0

BCO	Switch-on behaviour 1=Switch -on of picture via internal delay 0=Without delay	00(4)
OSO	1=Switch off in vertical overscan 0=Switch-off undefind	18(7)
SBL	Service blanking 1= on 0= off	0B(7)
HBL	RGB Blanking Mode 1 = wide blanking, 0 = normal blanking	02(7)
FCO	Forced Color-on 1=no colour killer 0=normal colour killer function	1B(0)
FFI	Fast filler IF-PLL 1=increased time constant 0=normal time constant	1A(1)

No. 1F VP2

Item	-	-	MAT	DS	DSA	EBS	BLS	BKS
KV-HA21M80	0	0	0	0	0	0	0	1

MAT	PAL-SECAM-/NTSC Matrix 1 =PAL matrix, 0=adapted to standard	0E(7)
DS	Dynamic skin control on/off 1= on 0= off	1A(3)
DSA	Dynamic skin control angle 1=correction angle 117 degrees 0=correction angle 123 degrees	1A(2)
EBS	Extended Blue Stretch 1= on 0= off	1A(0)
BLS	Blue stretch 1= on 0= off	18(4)
BKS	Black stretch 1= on 0= off	18(3)

No. 20 VP3

Item	BB	AKB	BPS	CB	ACL	CL2	CL1	CL0
KV-HA21M80	0	0	0	0	1	0	0	0

BB	Blue back when no video signal is identified 1= on 0= off	18(0)
AKB	Black current stabilisation 1=not active 0=active	02(6)
BPS	Bypass of chroma base-band delay line 1=bypassed 0=active	19(6)
CB	Chroma bandpass centre frequency 1= 1.1x Fsc 0=Fsc	18(5)
ACL	Automatic colour limiting 1= active 0= not active	19(5)

CL2	CL1	CL0	Cathode Drive amplitude
0	0	0	57V
0	0	1	63V
0	1	0	70V
0	1	1	77V
1	0	0	84V
1	0	1	91V
1	1	0	99V
1	1	1	107V

No. 4E OP1

Item	HA ME VOL	AV Input		COMB	B/G	I	D/K	M
KV-HA21M80	0	0	1	0	1	1	1	1

HA ME Vol — Tone controller Volume curve setting. 1 = for HA(ME), 0 = for HA(GE)

AV Input — 00 = no AV Input model; 01 = 1 AV Input model; 10 = 2 AV Input model; 11 = Not available

COMB (for NTSC model) — 1 = Enable external comb filter, 0 =Disable external comb filter

Other optional function will be enabled if the corresponding bit is set to 1.

No. 4F OP2

Item	No NICAM	US ST	HDEV	I V-Curve	XTAL SEL		SECAM	2nd Lang.
KV-HA21M80	0	0	0	0	1	1	1	1

No NICAM — 1 = NICAM search is disable in any TV system, 0 = NICAM search operates

US ST — (Reserved for NTSC model)

1 V-Curve (for monaural model) — 1 = using common volume curve for every mode and every TV system
0 = another volume curve available for video mode and M system

XTAL SEL — 00 = only 4.43 XTAL 01 = only 3.58 XTAL
10 = not used 11 = both 4.43 and 3.58 XTAL

Other optional function will be enabled if the corresponding bit is set to 1.

No. 50 OP3

Item	Pict Rot.	Auto TV Sys.	No Bal.	SPC SOUND	Korean ST	VM	H.K. Bil.	Thai Bil.
KV-HA21M80	0	0	0	0	0	0	0	0

No Bal. (for AV stereo model) — 1 = no balance in analog select items, 0 = balance included

SPC SOUND — 1 = Space Sound available, 0 = not available

Korean ST — (Reserved for NTSC model)

H.K. Bil. (for monaural model) — 1 = NICAM bilingual available (No NICAM stereo), 0 = not available

Other optional function will be enable if the corresponding bit is set to 1.

ITEM INFORMATION (KV-HA21N80/N70)

No. 1E VP1

Item	-	-	BCO	OSO	SBL	HBL	FCO	FFI
KV-HA21N70	0	0	0	0	0	0	0	0
KV-HA21N80	0	0	0	0	0	0	0	0

BCO	Switch-on behaviour 1=Switch -on of picture via internal delay 0=Without delay	00(4)
OSO	1=Switch off in vertical overscan 0=Switch-off undefind	18(7)
SBL	Service blanking 1= on 0= off	0B(7)
HBL	RGB Blanking Mode 1 = wide blanking, 0 = normal blanking	02(7)
FCO	Forced Color-on 1=no colour killer 0=normal colour killer function	1B(0)
FFI	Fast filler IF-PLL 1=increased time constant 0=normal time constant	1A(1)

No. 1F VP2

Item	-	-	MAT	DS	DSA	EBS	BLS	BKS
KV-HA21N70	0	0	0	0	0	0	0	1
KV-HA21N80	0	0	0	0	0	0	0	1

MAT	PAL-SECAM-/NTSC Matrix 1 =PAL matrix, 0=adapted to standard	0E(7)
DS	Dynamic skin control on/off 1= on 0= off	1A(3)
DSA	Dynamic skin control angle 1=correction angle 117 degrees 0=correction angle 123 degrees	1A(2)
EBS	Extended Blue Stretch 1= on 0= off	1A(0)
BLS	Blue stretch 1= on 0= off	18(4)
BKS	Black stretch 1= on 0= off	18(3)

No. 20 VP3

Item	BB	AKB	BPS	CB	ACL	CL2	CL1	CL0
KV-HA21N70	0	0	0	0	1	0	0	0
KV-HA21N80	0	0	0	0	1	0	0	0

BB	Blue back when no video signal is identified 1= on 0= off	18(0)
AKB	Black current stabilisation 1=not active 0=active	02(6)
BPS	Bypass of chroma base-band delay line 1=bypassed 0=active	19(6)
CB	Chroma bandpass centre frequency 1= 1.1x Fsc 0=Fsc	18(5)
ACL	Automatic colour limiting 1= active 0= not active	19(5)

CL2	CL1	CL0	Cathode Drive amplitude
0	0	0	57V
0	0	1	63V
0	1	0	70V
0	1	1	77V
1	0	0	84V
1	0	1	91V
1	1	0	99V
1	1	1	107V

No. 32 OP1

Item	HA ME VOL	AV Input		COMB	B/G	I	D/K	M
KV-HA21N80	0	0	1	0	1	1	1	1
KV-HA21N70	0	0	1	0	1	1	1	1

HA ME Vol — Tone controller Volume curve setting. 1 = for HA(ME), 0 = for HA(GE)

AV Input — 00 = no AV Input model; 01 = 1 AV Input model; 10 = 2 AV Input model; 11 = Not available

COMB (for NTSC model) — 1 = Enable external comb filter, 0 =Disable external comb filter

Other optional function will be enabled if the corresponding bit is set to 1.

No. 33 OP2

Item	No NICAM	US ST	HDEV	I V-Curve	XTAL SEL		SECAM	2nd Lang.
KV-HA21N70	0	0	0	0	1	1	1	1
KV-HA21N80	0	0	0	0	1	1	1	1

No NICAM (Multi Model Only) — 1 = NICAM search is disable in any TV system, 0 = NICAM search operates

US ST — (Reserved for NTSC model)

1 V-Curve (for monaural model) — 1 = using common volume curve for every mode and every TV system
0 = another volume curve available for video mode and M system

XTAL SEL — 00 = only 4.43 XTAL 01 = only 3.58 XTAL
10 = not used 11 = both 4.43 and 3.58 XTAL

Other optional function will be enabled if the corresponding bit is set to 1.

No. 34 OP3

Item	Pict Rot.	Auto TV Sys.	No Bal.	SPC SOUND	Korean ST	VM	H.K. Bil.	Thai Bil.
KV-HA21N70	0	0	0	0	0	0	0	0
KV-HA21N80	0	0	0	0	0	0	0	0

No Bal. (for AV stereo model) — 1 = no balance in analog select items, 0 = balance included

SPC SOUND — 1 = Space Sound available, 0 = not available

Korean ST — (Reserved for NTSC model)

H.K. Bil. (Multi Model Only) — 1 = NICAM bilingual available (No NICAM stereo), 0 = not available

Thai. Bil. (Multi Model Only)

Other optional function will be enable if the corresponding bit is set to 1.

OPERATION GUIDE

SERVICE MODE

How to set up new NVM (or initialize already written one)
(1) AC ON
(2) Enter Service Mode - describing below how to enter
(3) Push the commander button “5” and “0” sequentially (only set initial data into RAM, but not write them into NVM yet)
(4) Push the commander button “2” and “0” sequentially (copy the data into all NVM area - all wide modes and 50/60Hz respectively)
(5) Push the commander button “8” and “0” sequentially (initialize user data, select program 1 and exit Service Mode)
(6) Select TV system and execute Auto Preset

How to enter Service Mode
- At power ON, push the commander button “test” and “TV ON” sequentially
- At stand-by, push the commander button “display”, “5”, “vol +” and “power” sequentially

How to exit Service Mode
- Push the commander button “other ON” or power (AC) OFF

How to increment/decrement items and data
- Items : push the commander button “1” / “4”
- Data : push the commander button “3” / “6” (not write into NVM)

Other operations
- Write data into NVM - push the commander button “mute” and “0” sequentially
- Read data from NVM - push the commander button “7” and “0” sequentially
- Copy 50Hz data into 60Hz area - push the commander button “display” and “0” sequentially

SELF DIAGNOSIS MODE

How to enter Self Diagnosis Mode
- At stand-by, push the commander button “display”, “5”, “vol-” and “power” sequentially

How to exit Self Diagnosis Mode
- Push the commander button “other ON” or power (AC) OFF

Other operations
- Clear data and Write into NVM - push the commander button “8” and “0” sequentially

HOTEL TV MODE

How to enter Hotel TV Mode ON stage
- At stand-by, push the commander button “display”, “MUTE”, “vol +” and “power” sequentially
- The Hotel TV setup display, where the maximum level of the volume can be applied (=35 or above)
- Write data into NVM - push the commander button “mute” and “0” sequentially

How to enter Hotel TV Mode OFF stage
- At stand-by, push the commander button “display”, “MUTE”, “vol -” and “power” sequentially
- Write data into NVM - push the commander button “mute” and “0” sequentially

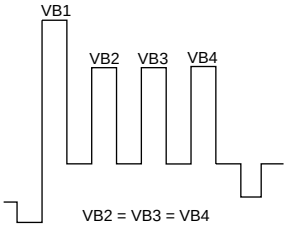
Modification Note (KV-HA21M80)
The item including the new addition is yellow.
1. The flag was added to bit 7 of OP1. This is the flag which chooses the volume curve used by HA (ME) model. (V2. IC).

Modification Note (KV-HA21N80/HA21N70)
The item including the new addition is yellow.

4-3. PICTURE QUALITY ADJUSTMENT

SUB COLOR ADJUSTMENT

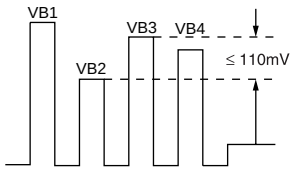
1. Select Video.
2. Input a PAL color-bar.
3. Set to the following condition:
   PICTURE 100%, BRIGHTNESS 50%, COLOR 50%
4. Connect an oscilloscope to pin ① (B OUT) of CN300, A board.
5. Set to Service Mode and select 13 'SC1' with [1] and [4] of the commander then adjust to VB2=VB3=VB4 with [3] and [6].
6. Press [MUTING] → [0] of the commander to write the data.
7. Adjust 13 'SC1' as step 2 to 5 when receiving NTSC color-bar.



VB2 = VB3 = VB4 (Difference is within 70mV)

SUB HUE ADJUSTMENT

1. Select Video.
2. Input a NTSC 3.58, color-bar into Video/TV mode.
3. Set the following condition:
   PICTURE 100%, BRIGHTNESS 50%, COLOR 50%
4. Connect an oscilloscope to pin ① (B OUT) of CN300, A board.
5. Select 11"SHU" with [1] and [4] of the commander by setting to Service Mode and adjust to VB1=VB2=VB3=VB4 with [3] and [6] .



VB1 = VB2 = VB3 = VB4

The highest level of VB1,VB2,VB3,VB4 must be aligned at the same line. Ideal difference level between VB2 and VB3 should be within ± 110mV.

6. Press [MUTING] → [0] of the commander to write the data.
7. Select TV channel with NTSC 3.58 and repeat 3 to 5.
8. Press [MUTING] → [0] of the commander to write the data.
9. Single system model with NTSC 4.43, select TV channel with NTSC 4.43 and repeat 3 to 5.

4-4. DEFLECTION ADJUSTMENT

NORMAL MODE (50Hz)

1. Set to Service mode.
2. Input PAL color bar.
3. Using the [1] and [4] button, select category GEO (Service Mode).
4. Raise/lower the data using the [3] and [6] buttons.
   Select and adjust the following items to obtain optimum image.

Service Item

GEO :	00	HPS	H POSITION
	01	HSZ	H SIZE
	02	PAP	PIN AMPLITUDE
	03	CPN	CORNER PIN
	04	TLT	TILT
	05	VSL	V SLOPE
	06	VAP	VERTICAL AMPLITUDE
	07	SCO	S CORRECTION
	08	VPS	V SHIFT

NORMAL MODE (60Hz)

5. Input 525/60Hz signal.
6. Using the [1] and [4] buttons select category GEO (Service Mode).
7. Select and adjust the following items to obtain obtimum image.
   Raise/lower the data with the [3] and [6] buttons.

Service Item

GEO :	00	HPS	H POSITION
	01	HSZ	H SIZE
	02	PAP	PIN AMPLITUDE
	03	CPN	CORNER PIN
	04	TLT	TILT
	05	VSL	V SLOPE
	06	VAP	VERTICAL AMPLITUDE
	07	SCO	S CORRECTION
	08	VPS	V SHIFT

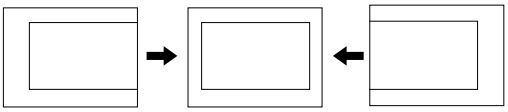
4-5. A BOARD ADJUSTMENT AFTER IC003 (MEMORY) REPLACEMENT

1. Enter to Service Mode.
2. Press commander buttons [5] and [0] (Data Initialize), and [2] and [0] (Data Copy) to initialize the data.
3. Call each item number and check if the respective screen shows the normal picture.
   In cases where items are not well adjusted, rectify the fine adjustment.
   Write the data per each item number ([MUTING] +[0]).
4. Select item numbers 4E 'OP0', 4F 'OP1', 50 'OP2' and respectively set the bit per model with command buttons [3] and [6] .
5. Press commander buttons [8] and [0] (Test Normal) to return to the data that was set on the shipment from the factory. (This will also cancel Service Mode.)

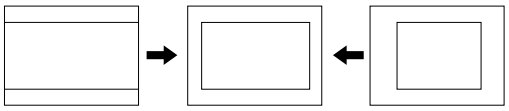
4-6. PICTURE DISTORTION ADJUSTMENT

Item Number 00 – 08

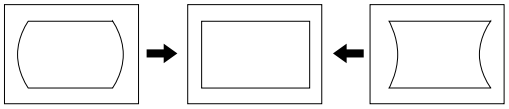
00 HPS (H POSITION)



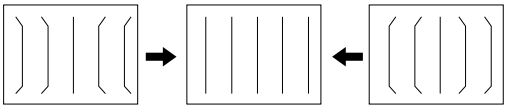
01 HSZ (H SIZE)



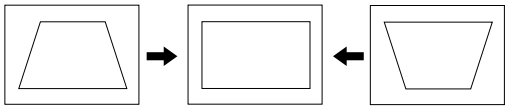
02 PAP (PIN AMPLITUDE)



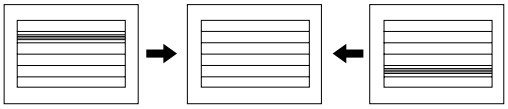
03 CPN (CORNER PIN)



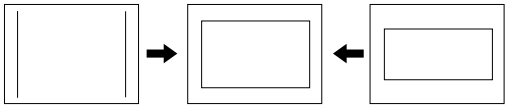
04 TLT (TILT)



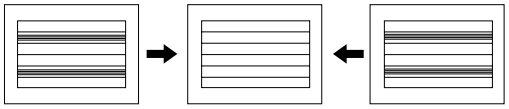
05 VSL (V SLOPE)



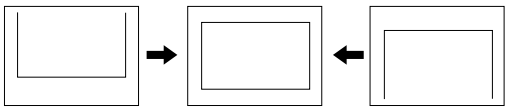
06 VAP (VERTICAL AMPLITUDE)



07 SCO (S CORRECTION)



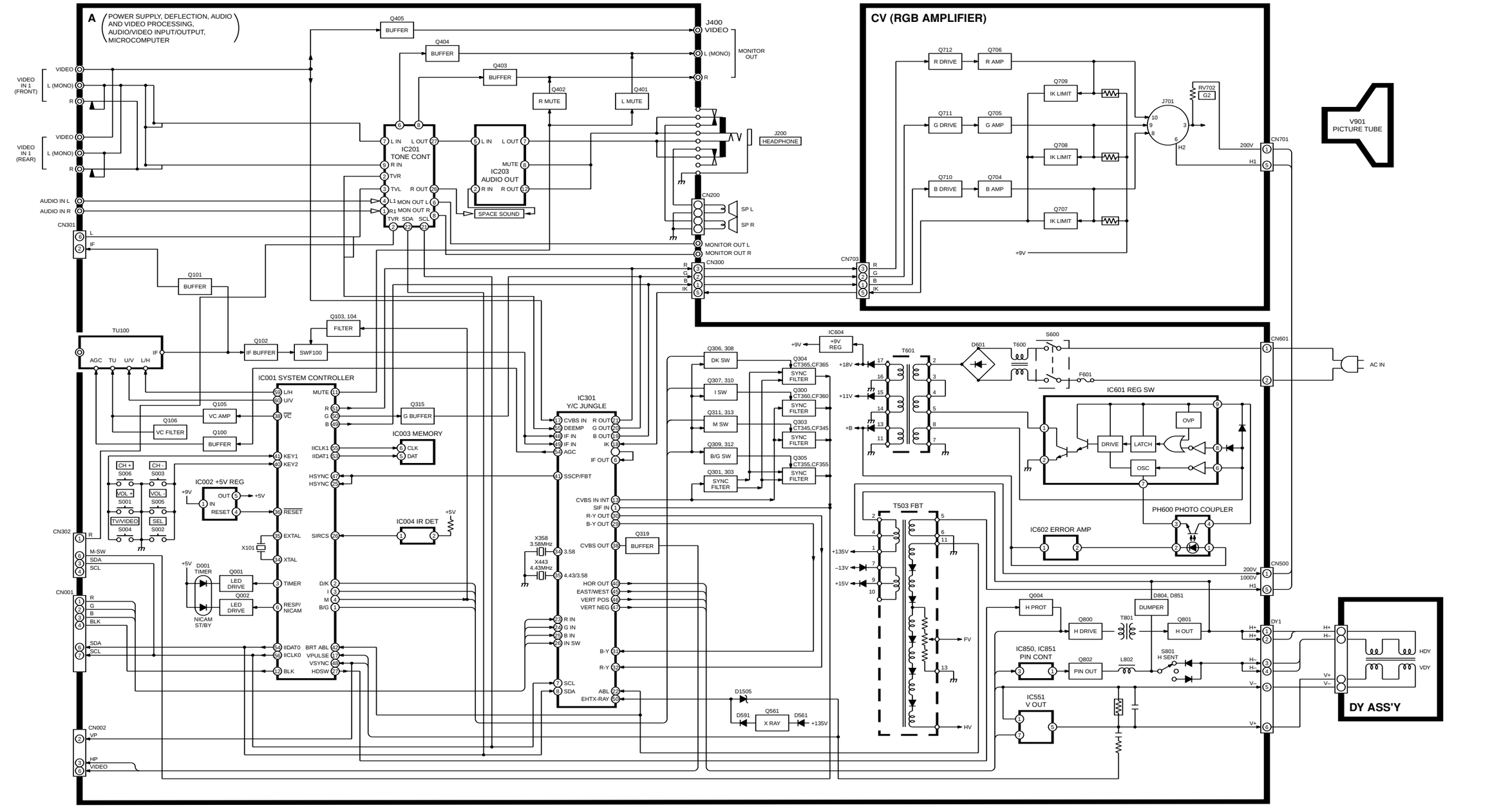
08 VPS (V SHIFT)



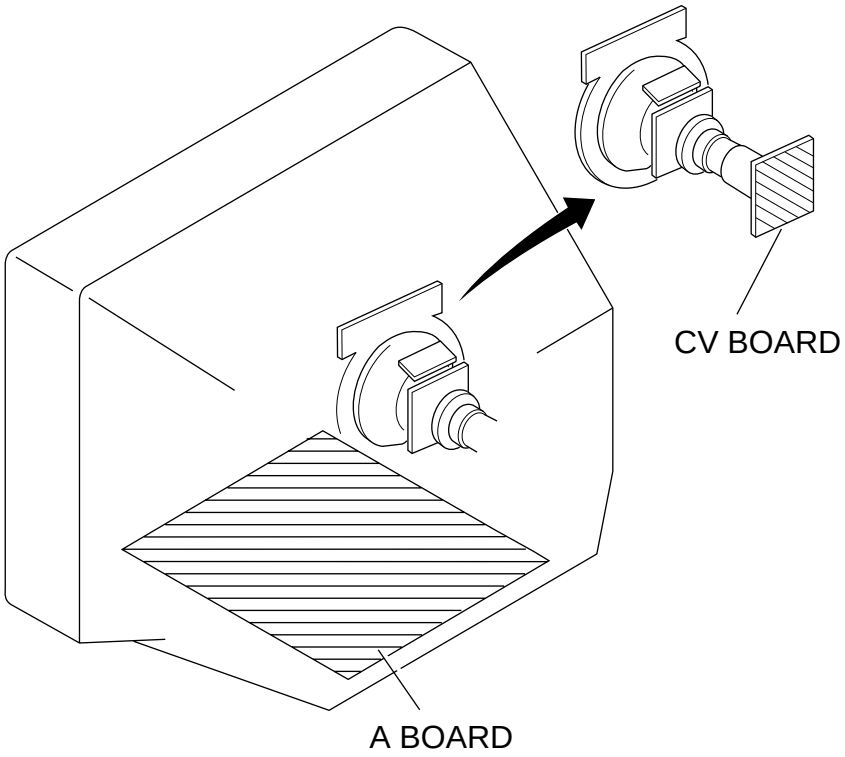
KV-HA21M80/HA21N70/HA21N80
RM-969 RM-968

SECTION 5
DIAGRAMS

5-1. BLOCK DIAGRAM



5-2. CIRCUIT BOARDS LOCATION



5-3. SCHEMATIC DIAGRAM

Note:

- All capacitors are in µF unless otherwise noted.
- All electrolytic capacitors are rated at 50V unless otherwise noted.
- All resistors are in ohms.
  kΩ = 1000Ω, MΩ = 1000kΩ
- Indication of resistance which does not have rating electrical power is as follows.

Pitch: 5 mm Rating electrical power 1/4W (CHIP: 1/10W)

- : nonflammable resistor.
- △ : internal component.
- : panel designation or adjustment for rrepair.
- All variable and adjustable resistors have characteristic curve B unless otherwise noted.
- **Redings are taken with a color-bar signal input.**
  no mark : COMMON
  ( ) : PAL
  [ ] : NTSC 3.58
- **Readings are taken with a 10 MΩ digital multimeter.**
- **Voltage are dc with respect to ground unless otherwise noted.**
- **Voltage variations may be noted due to normal production tolerances.**
- **All voltage are in Volt.**
- **✻ : Cannot be measured.**
- **Circled numbers are waveform references.**
- **: B +bus.**
- **: B –bus.**
- **: signal path.**

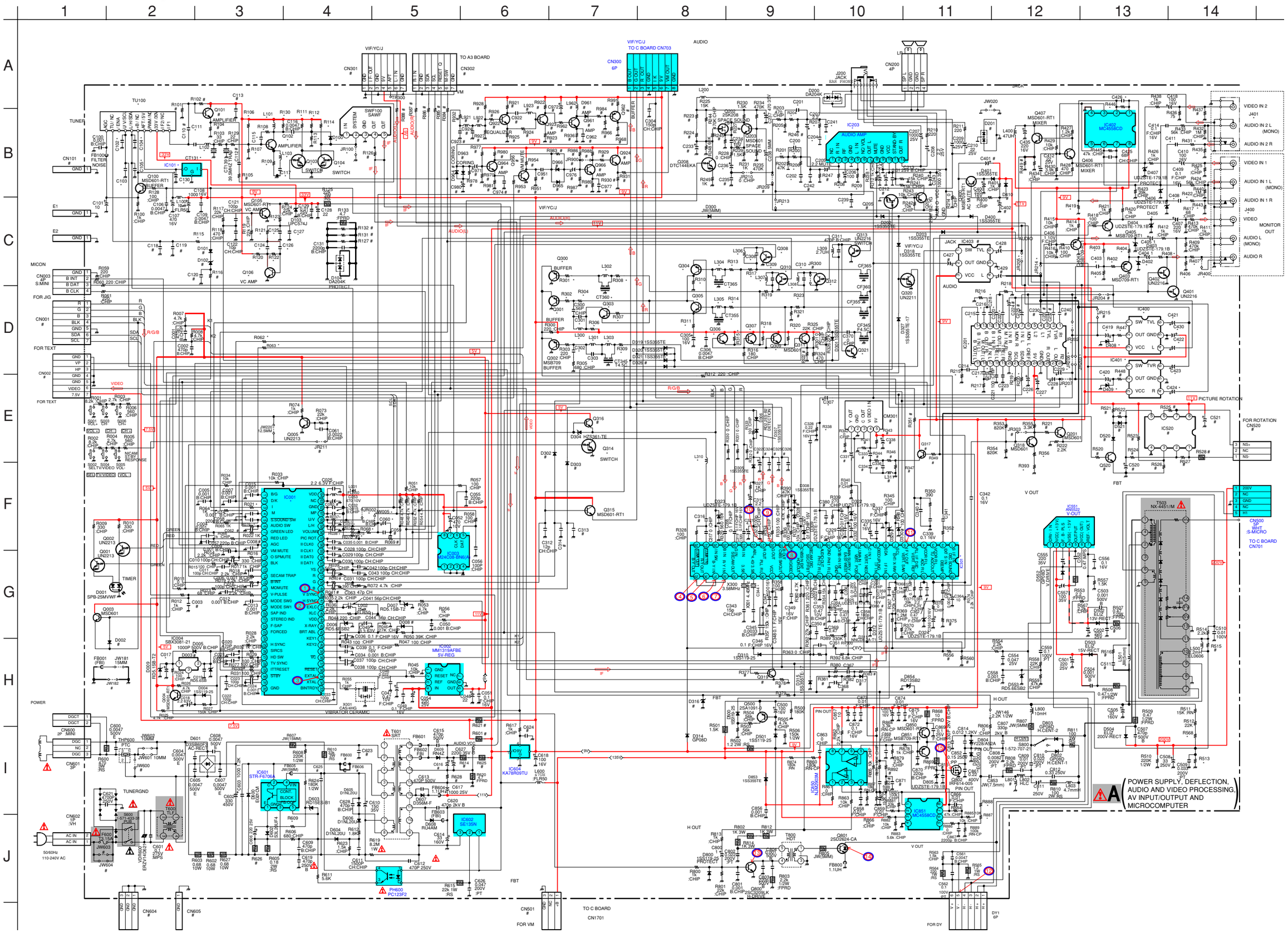
Reference information

RESISTOR	: RN	METAL FILM
	: RC	SOLID
	: FPRD	NONFLAMMABLE CARBON
	: FUSE	NONFLAMMABLE FUSIBLE
	: RS	NONFLAMMABLE METAL OXIDE
	: RB	NONFLAMMABLE CEMENT
	: RW	NONFLAMMABLE WIREWOUND
	: ✻	ADJUSTMENT RESISTOR
COIL	: LF-8L	MICRO INDUCTOR
CAPACITOR	: TA	TANTALUM
	: PS	STYROL
	: PP	POLYPROPYLENE
	: PT	MYLAR
	: MPS	METALIZED POLYESTER
	: MPP	METALIZED POLYPROPYLENE
	: ALB	BIPOLAR
	: ALT	HIGH TEMPERATURE
	: ALR	HIGH RIPPLE

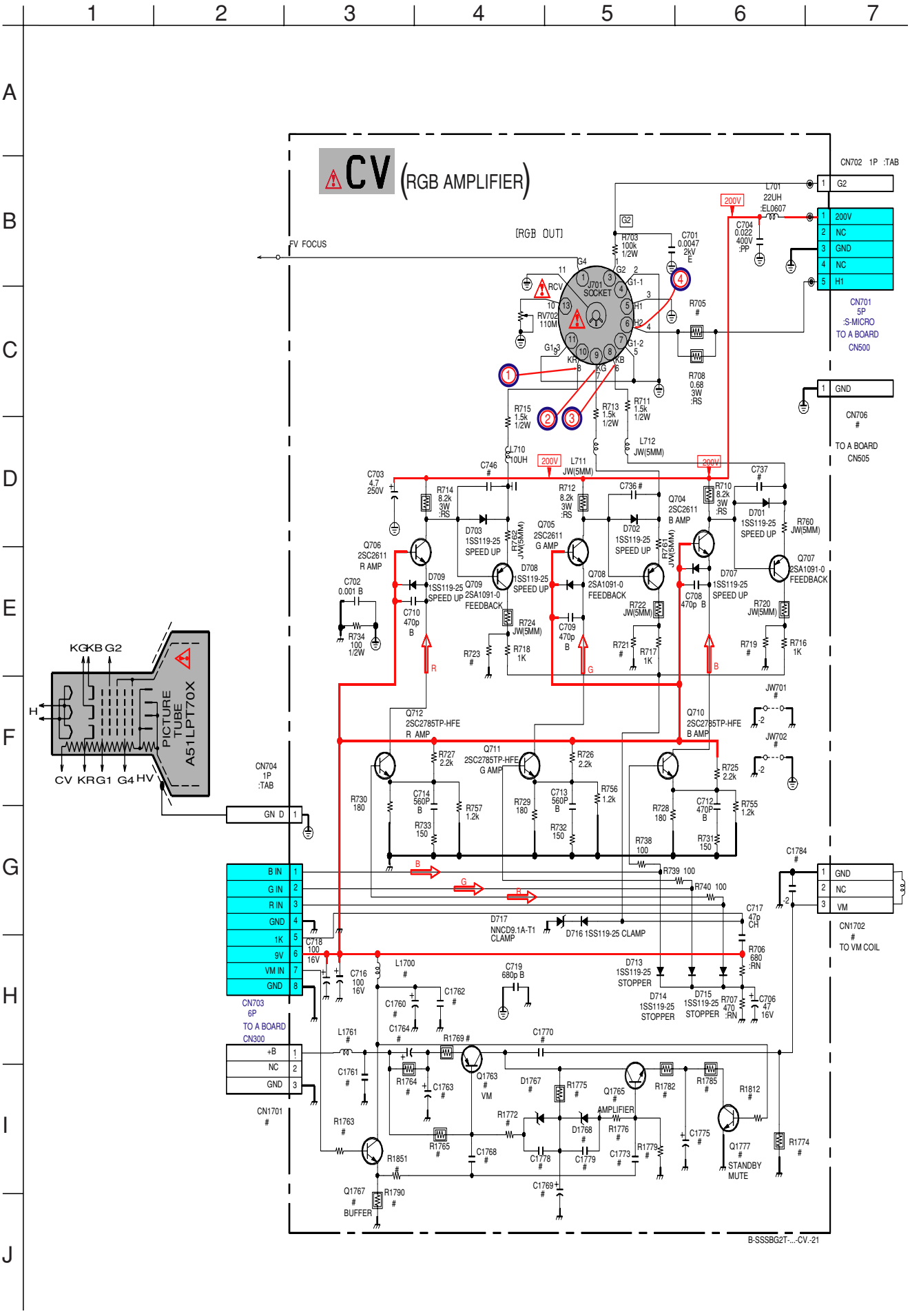
Note: The component identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

KV-HA21M80/HA21N70/HA21N80 RM-969 RM-968

(1) A Board Schematic Diagram


A
POWER SUPPLY, DEFLECTION, AUDIO AND VIDEO PROCESSING, AV INPUT/OUTPUT AND MICROCOMPUTER
TO C BOARD CN1701
FOR VM
FOR DY
FOR ROTATION CN520
PICTURE ROTATION
VIDEO IN 2 J401
AUDIO IN 2 L (MONO)
AUDIO IN 2 R
VIDEO IN 1
AUDIO IN 1 L (MONO)
AUDIO IN 1 R J400
VIDEO MONITOR OUT
AUDIO L (MONO)
AUDIO R
TO C BOARD CN701
FBT
TUNER
MICON
FOR JIG
FOR TEXT
POWER
TUNERGND
TIMER
VIBRATOR CERAMIC
IC001
IC002 MM1319AFBE 5V-REG
IC003 M24C08-BN6/A
IC402 MC4558CD
IC551 AN6552 V-OUT
IC601 STR-F6706A
IC602 SE135N
IC604 KA78R09TU
IC651 MC4558CD
T503 NX-4451I/M
T600 TLF
T601 SRT
PH600 PC123F2
Q600 6T-453-58 PUB
Q315 MSD601-RT1
Q316 HZS361-TE
Q314 SWITCH
Q103 SWITCH
Q104 SWITCH
Q106 VC AMP
Q105 MSD601-RT1 VC AMP
Q100 MSD601-RT1 BUFFER
Q300 BUFFER
Q301 BUFFER
Q302 MSB709 BUFFER
Q303 CT300
Q304 BUFFER
Q305 BUFFER
Q306 BUFFER
Q307 BUFFER
Q308 BUFFER
Q309 BUFFER
Q310 BUFFER
Q311 BUFFER
Q312 BUFFER
Q313 UN2216 SWITCH
Q320 UN2211
Q321 MSD601
Q317 MSD601
Q318 MSD601
Q319 MSD601
Q401 UN2216
Q402 UN2216
Q403 MSD709-RT1
Q404 MSD709-RT1
Q405 MSB709-RT1
Q406 MSD601-RT1 MIXER
Q407 MSD601-RT1 MIXER
Q408 MSD601-RT1 AC MUTE
Q409 MSD601-RT1 AC MUTE
Q410 MSD601-RT1 AC MUTE
Q411 MSD601-RT1 AC MUTE
Q412 MSD601-RT1 AC MUTE
Q413 MSD601-RT1 AC MUTE
Q414 MSD601-RT1 AC MUTE
Q415 MSD601-RT1 AC MUTE
Q416 MSD601-RT1 AC MUTE
Q417 MSD601-RT1 AC MUTE

(2) CV Board Schematic Diagram



A Board ✲ Mark List

	KV-HA21N70	KV-HA21M80	KV-HA21N80
C018	2.2	2.2 6.3V	2.2
C026	#	0.001 B:CHIP	#
C027	#	0.001 B:CHIP	#
C045	3.3	3.3 63V	3.3
C102	#	0.1 25V F:CHIP	#
C103	#	0.1 25V F:CHIP	#
C104	#	0.1 25V F:CHIP	#
C105	#	0.1 25V F:CHIP	#
C111	39P :CHIP	0.01P 25V B:CHIP	39P :CHIP
C115	0 :CHIP	0.0047 B:CHIP	0 :CHIP
C117	#	56P	#
C124	#	0.068PP	#
C125	#	0.1	#
C126	#	0.068PP	#
C127	#	100P	#
C130	100 16V	#	100 16V
C200	0.01 25V B:CHIP	0.022P B:CHIP	0.022 B:CHIP
C201	0.01 25V B:CHIP	0.022P B:CHIP	0.022 B:CHIP
C202	0.22	0.001 :PP	0.001
C204	0.22	0.001 :PP	0.001
C205	2.2	2.2 6.3V	2.2
C214	#	0.1 16V B:CHIP	0.1 16V
C215	#	0.1 16V B:CHIP	0.1 16V
C216	#	0.1 16V B:CHIP	0.1 16V
C217	#	0.022P 16V:CHIP	0.022 16V
C218	#	0.1 16V B:CHIP	0.1 16V
C219	#	0.018 16V:CHIP	0.018 16V
C220	#	0.022 16V:CHIP	0.022 16V
C221	#	0.0047	0.0047
C222	#	0.018 16V:CHIP	0.018 16V
C223	#	0.0047	0.0047
C224	#	1P	1
C225	#	1P	1
C226	#	4.7	4.7
C227	#	47 16V	4.7 16V
C228	#	1P	1
C229	#	0.47	0.47
C 230	#	2.2 6.3V	2.2 6.3V
C231	#	2.2 6.3V	2.2 6.3V
C232	#	2.2 6.3V	2.2 6.3V
C238	2.2	#	#
C240	#	2.2 6.3V	2.2 6.3V
C241	00082 B:CHIP	0.0047 B:CHIP	0.0015 B:CHIP
C242	0.015	0.0047	0.0015
C300	#	47P	#
C301	#	27P	#
C302	11P	47P	11P
C303	62P	68P	62P
C307	2.2	#	#
C308	#	390P	#
C309	#	330P	#
C310	#	390P	#
C315	2.2	2.2 63V	2.2
C316	#	47P	#
C341	0.1 25V:CHIP	#	#
C344	15P :CHIP	16P :CHIP	15P :CHIP
C403	#	1.0 10V F:CHIP	1.0 10V F:CHIP
C404	#	1P	1
C408	#	0.1 25V F:CHIP	0.1 25V
C411	#	0.1 25V F:CHIP	0.1 25V
C419	10	#	#
C421	10	#	#
C422	10	#	#
C426	#	68P	68P
C430	10	#	#
CF355	#	F5.5C	#
CF360	#	F6.0C	#
CF365	#	F6.5C	#
CT131	82	Trap Ceramic	82
CT139	#	Trap Ceramic	#
CT355	#	T55B	#
CT360	#	T60B	#

A Board ✲ Mark List

	KV-HA21N70	KV-HA21M80	KV-HA21N80
CT365	#	T65B	#
D100	#	MTS MA77	#
D331	#	UDZSTE-179-1B	#
D332	#	UDZSTE-179-1B	#
D333	#	UDZSTE-179-1B	#
D402	#	NNCD9.1A-TI	NNCD9.1A-TI
D405	#	NNCD9.1A-TI	NNCD9.1A-TI
D408	UDZSTE-179-1B	#	#
FB001	1.1UH	0UH	1.1UH
FB800	1.1UH	0UH	1.1UH
IC001	CXP85220A-083S	CXP85224A-080S	CXP85220A-083S
IC101	TA7805S	#	TA7805S
IC201	#	TDA7438DO13TR	TDA7438DO13TR
IC301	TDA8843/N2	TDA8844/N2	TDA8843/N2
IC400	MM1501XNRE	#	#
J400	4P	6P	6P
J401	2P	3P	3P
JR002	0 :CHIP	#	0 :CHIP
JR006	#	0 :CHIP	0 :CHIP
JR016	#	0 :CHIP	0 :CHIP
JR034	#	0 :CHIP	#
JR100	0 :CHIP	#	0 :CHIP
JR202	0 :CHIP	#	#
JR205	#	0 :CHIP	0 :CHIP
JR213	0 :CHIP	#	#
JR400	#	0 :CHIP	0 :CHIP
L101	#	1.2UH	#
L102	0.33UH	0.22UH	0.33UH
L103	#	0.33UH	#
L200	68	47	68
L300	#	18UH	#
L301	18UH	12UH	18UH
L302	#	8.2UH	#
L303	18UH	8.2UH	18UH
L304	#	12UH	#
L305	#	12UH	#
L306	#	1.8UH	#
L307	#	2.2UH	#
L308	#	2.2UH	#
L310	#	27UH	#
Q102	#	2SC3779C-D-AA	#
Q103	#	UN2216	#
Q104	#	UN2216	#
Q106	#	MSD609-RT1	#
Q300	#	MSB709-RT1	#
Q301	#	MSB709-RT1	#
Q303	#	MSD601-RT1	#
Q304	#	MSB709-RT1	#
Q305	#	MSB709-RT1	#
Q306	#	MSD601-RT1	#
Q307	#	MSD601-RT1	#
Q308	#	UN2216	#
Q309	#	MSD601-RT1	#
Q310	#	UN2216	#
Q312	#	UN2216	#
Q314	#	UN2211	#
Q321	UN2216	#	UN2216
R021	#	1.0K :CHIP	#
R037	#	1.0K :CHIP	#
R038	#	1.0K :CHIP	#
R062	#	1.0K :CHIP	#
R063	#	1.0K :CHIP	#
R076	100 :CHIP	#	100 :CHIP
R106	#	4.7K :CHIP	#
R107	1UH	3.9K CHIP	1UH
R108	0 :CHIP	470 :CHIP	0 :CHIP
R109	#	56 :CHIP	#
R111	#	10K :CHIP	#
R112	#	6.8K :CHIP	#
R113	#	2.2K :CHIP	#
R114	#	2.2K :CHIP	#
R115	#	4.7K :CHIP	#

A Board ✲ Mark List

	KV-HA21N70	KV-HA21M80	KV-HA21N80
R120	#	1.8K :CHIP	#
R121	#	22K :CHIP	#
R122	#	330K :CHIP	#
R123	#	22K :CHIP	#
R130	#	1.0K :CHIP	#
R134	470 :CHIP	0 :CHIP	470 :CHIP
R135	470 :CHIP	0 :CHIP	470 :CHIP
R200	6.8K :CHIP	3.3K :CHIP	3.3K :CHIP
R201	1K :CHIP	1.5K :CHIP	5.6K :CHIP
R202	#	47K :CHIP	22K
R203	1.2K	470 :CHIP	3.3K
R204	5.6K :CHIP	3.3K :CHIP	3.3K :CHIP
R205	#	#	22K :CHIP
R206	3.3K :CHIP	12K :CHIP	12K :CHIP
R207	3.3K :CHIP	12K :CHIP	12K :CHIP
R208	33K :CHIP	10K :CHIP	10K
R209	15K :CHIP	10K :CHIP	10K
R215	#	3.3K :CHIP	3.3K
R216	#	3.3K :CHIP	3.3K
R217	#	2.7K :CHIP	2.7K
R218	#	2.7K :CHIP	2.7K
R219	#	100 :CHIP	100
R220	#	100 :CHIP	100
R225	47K	15K	15K
R301	#	220 :CHIP	#
R302	#	220 :CHIP	#
R304	#	1.2K :CHIP	#
R306	#	390K :CHIP	#
R307	#	220 :CHIP	#
R308	#	120 :CHIP	#
R309	470 :CHIP	150 :CHIP	470 :CHIP
R310	#	390 :CHIP	#
R311	#	2.2K :CHIP	#
R313	#	330 :CHIP	#
R314	#	330 :CHIP	#
R315	#	22K :CHIP	#
R317	#	470 :CHIP	#
R318	#	22K :CHIP	#
R319	#	470 :CHIP	#
R320	#	22K :CHIP	#
R323	#	470 :CHIP	#
R338	15K :CHIP	#	#
R352	15K :CHIP	#	#
R356	680 :CHIP	3.3K :CHIP	3.3K :CHIP
R393	1.0K :CHIP	0 :CHIP	0 :CHIP
R394	7.5K	#	7.5K
R402	#	100 :CHIP	100
R403	#	10K :CHIP	10K :CHIP
R404	#	1.0K :CHIP	1K
R405	#	10K :CHIP	10K :CHIP
R406	#	470K :CHIP	470K
R407	#	1.0K :CHIP	1K
R408	#	1.0K :CHIP	1K
R419	#	39K :CHIP	39K :CHIP
R422	#	56K :CHIP	56K
R431	#	56K :CHIP	56K
R435	#	1.0M	1.0M
R443	#	1.0M	1.0M
R446	#	47K :CHIP	47K
R447	100 :CHIP	#	#
R512	22K	22K 0.25W	22K
R513	10K	10K 0.25W	10K
R568	47K	47K 0.25W	47K
R887	220K :RN	220K 0.25W	220K :RN
R888	220K :RN	220K 0.25W	220K :RN
TU100	BTP-AA401	BT-AG402	BTP-AA401

Note: The parts indicated as "#" in this circuit diagram are not listed here, as they are not used for these models.

CV Board ✲ Mark List

	KV-HA21N70	KV-HA21M80	KV-HA21N80
R706	680 RN	680 0.25W	680
R707	470 RN	470 0.25W	470

Note: The parts indicated as "#" in this circuit diagram are not listed here, as they are not used for these models.

5-4. VOLTAGE MEASUREMENTS

A BOARD VOLTAGE LIST

Ref	Pin No.	Voltage[v]
IC001	1	(4.6)[0]
	2	0
	3	0
	4	(0)[4.5]
	5	4.8
	6	(0)[4.9]
	7	0
	8	0
	9	4.9
	10	4.6
	11	0
	12	0
	13	0
	14	4.7
	15	4.9
	16	0
	17	4.7
	18	0
	19	(0.9)[1.8]
	20	0
	21	4.9
	22	0
	23	(0)[4.9]
	24	(4.9)[0]
	25	0.4
	26	3.6
	27	0
	28	(0.8)[1.6]
	29	4.9
	30	4.7
	31	4.9
	32	0
	33	4.9
	34	2.3
	35	2.1
	36	4.9
	37	0
	38	(2)[4.8]
	39	(0.3)[1]
	40	4.9
	41	4.9
	42	(3.4)[3.0]
	43	(0.9)[1.6]
	44	4.9
	45	(4.9)[2.6]
	46	4.9
	47	0.4
	48	4.7
	49	0
	50	0
	51	0
	52	0
	53	4.9
	54	4.5
	55	4.9
	56	4.5
	57	3.6
	58	(0)[0.3]
	59	8.9
	60	(0.1)[8.9]
	61	0
	62	0
	63	4.9
	64	4.9
IC002	1	0
	2	4.9
	3	4.8
	4	11
	5	4.9
	6	0
	7	0
IC003	1	0
	2	0
	3	0
	4	0
	5	4.9
	6	4.9
	7	0
	8	4.9
IC004	1	4.7
	2	3.6
	3	0
IC101	I	9
	G	0
	O	0
IC201	1	4.5
	2	4.5
	3	4.5
	4	4.5
	5	4.5
	6	4.5
	7	4.5
	8	4.5
	9	4.5
	10	4.5
	11	4.5
	12	4.5
	13	4.5
	14	4.5
	15	4.5
	16	4.5
	17	4.5
	18	4.5
	19	4.5
	20	0
	21	4.6
	22	4.6
	23	4.5
	24	9
	25	0
	26	3.8
	27	3.8
	28	4.5
IC203	1	0
	2	0
	3	20.3
	4	0
	5	0
	6	0
	7	(*)[9.8]
	8	0.4
	9	0
	10	21
	11	9.7
	12	9.7
IC301	1	(0.9)[1.1]
	2	3.7
	3	0
	4	0
	5	(2.4)[3.6]
	6	(2.9)[4.4]
	7	4.6
	8	4.5
	9	6.6
	10	0
	11	3.3
	12	8.2
	13	(3.8)[4.6]
	14	0
	15	3.1
	16	(0.2)[0.5]
	17	(3.3)[3.9]
	18	6.7
	19	(2.8)[3.1]
	20	(2.7)[2.9]
	21	(2.8)[3.0]
	22	3.3
	23	3.4
	24	3.4
	25	3.4
	26	0
	27	(2.7)[2.9]
	28	(2.7)[2.9]
	29	2.3
	30	2.4
	31	2.3
	32	2.4
	33	0.3
	34	2.4
	35	2.4
	36	(4.8)[4.3]
	37	8.2
	38	2.5
	39	4.9
	40	1.5
	41	0.64
	42	3.1
	43	3.9
	44	0
	45	4.1
	46	1.3
	47	1.4
	48	4.6
	49	4.6
	50	1.6
	51	3.7
	52	3.8
	53	(4.6)[1.2]
	54	(4.2)[8.2]
	55	2.9
	56	(3.2)[4.1]
IC402	1	5.5
	2	2.5
	3	2.5
	4	0
	5	(9)[2.5]
	6	(5.5)[2.5]
	7	(2.5)[5.5]
	8	(2.4)[9]
IC520	1	9.4
	2	5.8
	3	5.8
	4	0
	5	2.2
	6	2.2
	7	2.2
	8	11.6

A BOARD VOLTAGE LIST

Ref	Pin No.	Voltage[v]
IC551	1	0.5
	2	13.6
	3	-12
	4	-13
	5	0.2
	6	13.7
	7	0.5
IC601	1	*
	2	*
	3	(*)[159]
	4	(*)[7]
	5	(*)[2]
IC602	1	(*)[118]
	2	(*)[135]
	3	0
IC604	1	(11)[11.6]
	2	9
	3	0
	4	4.7
IC850	1	2.1
	2	0.7
	3	1.5
	4	0
	5	2.5
	6	2.1
	7	5.8
	8	9
IC851	1	(2.3)[2.7]
	2	3.2
	3	3.2
	4	(0)[0.1]
	5	(0)[2.8]
	6	(2.6)[2.8]
	7	3.7
	8	9
Q001	B	0
	C	4.9
	E	0
Q002	B	0
	C	4.9
	E	0
Q003	B	0
	C	4.9
	E	0
Q004	B	0.1
	C	4.9
	E	0.1
Q005	B	0
	C	4.7
	E	(0)[0.2]
Q100	B	(3.6)[7.4]
	C	9
	E	(4.2)[8.1]
Q102	B	3.1
	C	2.4
	E	9
Q103	B	0
	C	3.2
	E	0
Q104	B	0
	C	(0)[5.5]
	E	3.2
Q105	B	0
	C	9(0)
	E	(0.3)[0.6]
Q106	B	0
	C	3.8
	E	0.6
Q201	B	5.6
	C	9
	E	6.2
Q202	B	(6)[3.3]
	C	(0)[1.3]
	E	(13)[13.4]
Q203	B	(5.5)[5.2]
	C	13
	E	(6.1)[5.8]
Q204	B	21.4
	C	21.4
	E	20.7
Q205	B	0
	C	0
	E	(4.7)[0.7]
Q208	B	1.3
	C	1.4
	E	4.8
Q300	B	(3.1)[0.2]
	C	0
	E	0
Q301	B	(3.2)[4.1]
	C	0
	E	(2.4)[4.8]
Q302	B	(0)[4.1]
	C	0
	E	(3.8)[3.6]
Q303	B	(2.4)[4.8]
	C	(7.8)[4.8]
	E	(3.0)[5.5]
Q304	B	(3.0)[5.8]
	C	(2.4)[4.8]
	E	(0)[9]
Q305	B	(2.9)[5.8]
	C	(2.3)[4.8]
	E	(2.3)[9]
Q306	B	9
	C	9
	E	(2.9)[4.3]
Q307	B	9
	C	9
	E	(2.9)[4.4]
Q308	B	0
	C	9
	E	0
Q309	B	(2.3)[9]
	C	9
	E	(2.9)[0.1]
Q310	B	0
	C	9.0
	E	0
Q311	B	(9)[3.5]
	C	9
	E	(2.9)[4.4]
Q312	B	0
	C	(0)[9.0]
	E	(3.8)[0]
Q313	B	0
	C	(8.9)[0]
	E	(0)[3.3]
Q314	B	0
	C	0
	E	4
Q315	B	2.7
	C	9
	E	0
Q316	B	0
	C	4.9
	E	0
Q317	B	0
	C	9
	E	0
Q318	B	2.6
	C	6.2
	E	3.2
Q319	B	3.8
	C	(8.2)[0.2]
	E	4.4
Q320	B	0
	C	(3.3)[5.4]
	E	0
Q400	B	11.4
	C	(1)[4.4]
	E	11.6
Q401	B	0
	C	(0.1)[0]
	E	(0.1)[0.2]
Q402	B	0
	C	(0.1)[0]
	E	(0.1)[0.2]
Q403	B	5.2
	C	0
	E	4.5
Q404	B	5.2
	C	0
	E	4.5
Q405	B	5.1
	C	0
	E	(4.4)[4.5]
Q406	B	1.8
	C	4.2
	E	2.5
Q407	B	3.5
	C	9
	E	4.2
Q500	B	(*)[133.7]
	C	0
	E	(*)[133.6]
Q520	B	0.6
	C	0
	E	0
Q800	B	0
	C	(*)[30]
	E	0
Q801	B	(0.1)[0]
	C	(*)[99]
	E	(*)[0]
Q802	D	(5.6)[10]
	G	(8)[5.5]
	S	0
Q850	B	5.6
	C	9
	E	5.9
Q851	B	5.6
	C	0
	E	5.7
Q922	B	2.0
	C	5.3
	E	2.7
Q923	B	(1.4)[1.9]
	C	(2.5)[9]
	E	(2.1)[2.4]

A BOARD VOLTAGE LIST

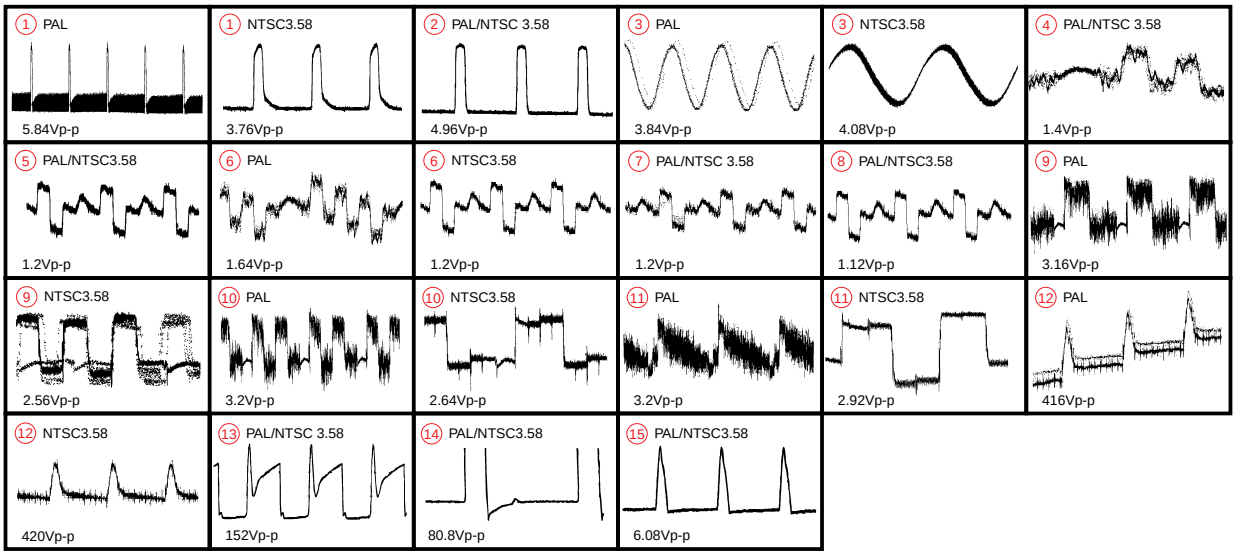
Ref	Pin No.	Voltage[v]
Q924	B C E	(5.5)[0] 9 (6.1)[8.5]
Q956	B C E	0 0 0.6
Q961	B C E	(1.9)[1.4] (9)[2.4] (2.5)[2.1]
Q962	B C E	8.3 3.2 7.7
Q964	B C E	0.9 6.6 1.5
Q966	B C E	1.0 6.1 1.6

CV BOARD VOLTAGE LIST

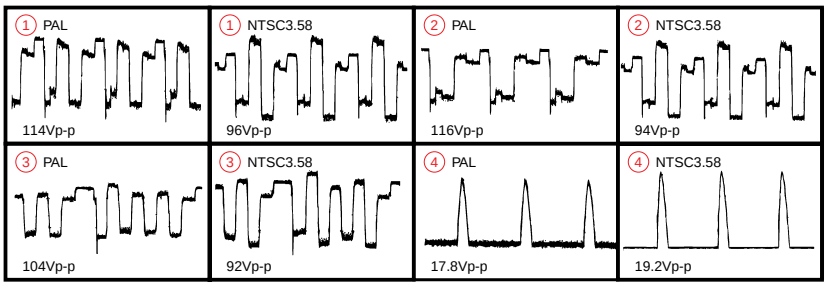
Ref	Pin No.	Voltage[v]	Ref	Pin No.	Voltage[v]	Ref	Pin No.	Voltage[v]
J701	KR KG KB H2 G2	(110)[102] (112)[104] (103)[96] (0.1)[0] 218	Q707	B C E	(105.6)[96] (7.8)[8.2] (102.5)[95]	Q712	B C E	2.8 8.4 2.1
Q704	B C E	(8.7)[9] (105.8)[96] (8.1)[8.4]	Q708	B C E	(112)[104] 8 (109)[102]	Q1763	B C E	133.9 68.9 134.5
Q705	B C E	9 (112)[104] 8.3	Q709	B C E	(111)[102] (8.1)[8.3] (108)[100]	Q1765	B C E	0.9 68.9 0.3
Q706	B C E	9 (111)[103] 8.4	Q710	B C E	2.9 8.4 (2.2)[2.4]	Q1767	B C E	5.5 9 4.8
			Q711	B C E	(2.7)[2.9] 8.4 (2.1)[2.3]	Q1777	B C E	0.7 0 0

5-5. WAVEFORMS

A BOARD WAVEFORM



CV BOARD WAVEFORM

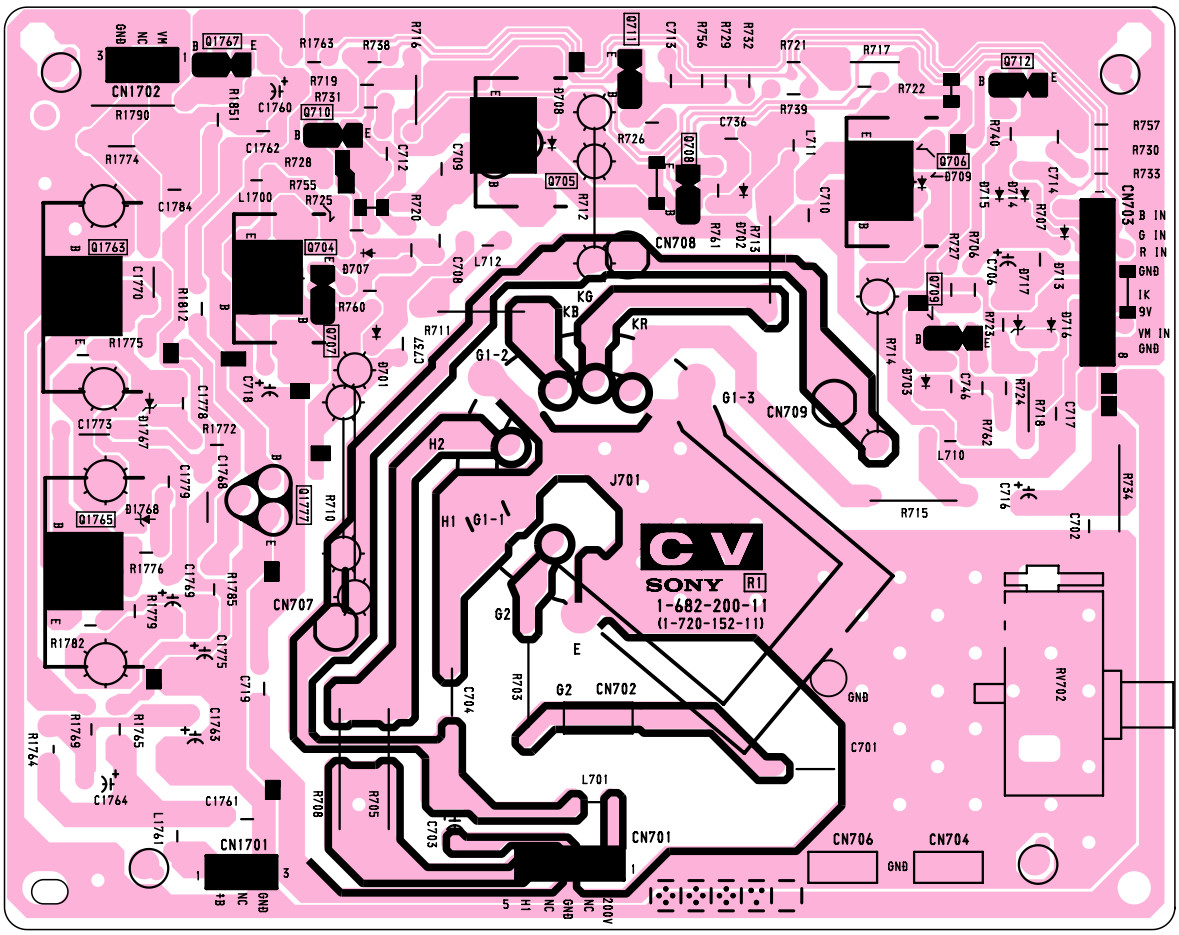


5-6. PRINTED WIRING BOARDS AND PARTS LOCATION

PRINTED WIRING BOARDS

CV [RGB AMPLIFER]

– CV Board –

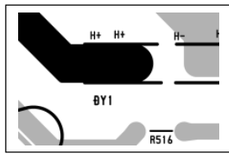


KV-HA21M80/HA21N70/HA21N80
RM-969 RM-968

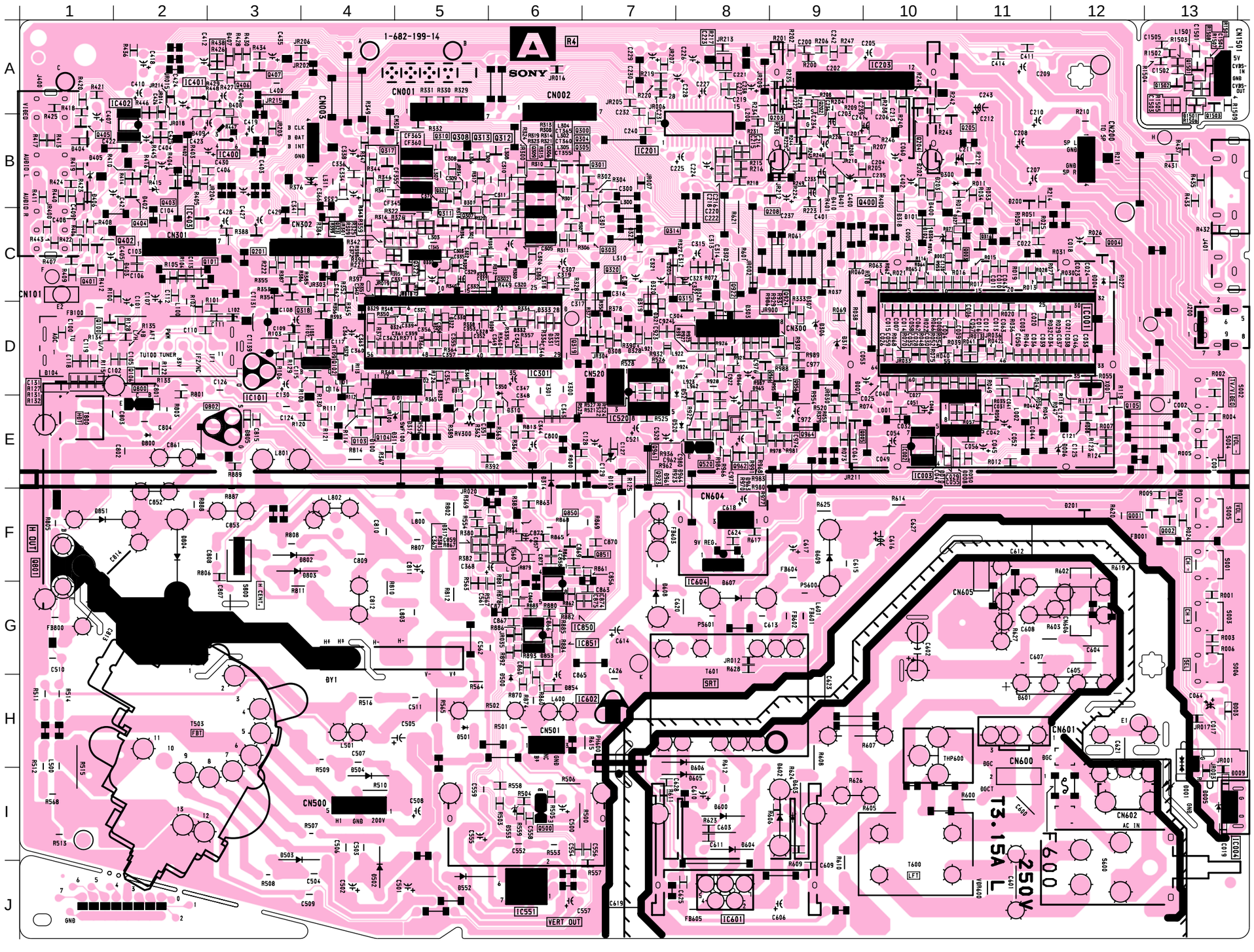
PRINTED WIRING BOARDS

A [POWER SUPPLY,DEFLECTION,
AUDIO AND VIDEO PROCESSING,
AUDIO/VIDEO INPUT/OUTPUT AND SYSTEM CONTROLLER]

– A Board –



NOTE:
The circuit indicated at left contains high voltage of over 1220 Vp-p. Please pay attention when inspecting or repairing it to prevent an electric shock.



A BOARD

IC

IC001	D-12
IC002	E-10
IC003	E-10
IC004	I-13
IC101	D-3
IC201	B-7
IC203	A-10
IC301	D-6
IC400	B-3
IC401	A-2
IC402	A-2
IC403	C-2
IC520	E-7
IC551	J-6
IC601	J-8
IC602	H-7
IC604	G-8
IC850	G-6
IC851	G-6
PH600	H-7

TRANSISTOR

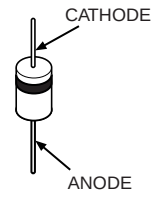
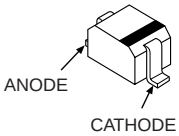
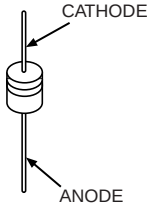
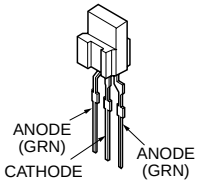
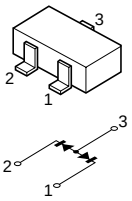
Q001	F-12
Q002	F-13
Q003	C-11
Q004	C-12
Q005	E-10
Q100	D-1
Q101	C-3
Q102	D-4
Q103	E-4
Q104	E-4
Q105	E-12
Q106	D-2
Q201	C-3
Q203	B-9
Q202	A-9
Q204	B-10
Q205	B-11
Q208	C-9
Q300	B-7
Q301	B-7
Q302	C-6
Q303	C-7
Q304	B-7
Q305	B-7
Q306	B-6
Q307	C-5
Q308	B-5
Q309	B-6
Q310	B-5
Q311	C-5
Q312	B-6
Q313	B-5
Q314	C-7
Q315	C-8
Q316	C-11
Q317	B-4
Q318	D-4
Q319	D-6
Q320	C-7
Q321	B-5
Q400	B-10
Q401	C-1
Q402	C-2
Q403	B-2
Q404	C-2
Q405	B-1
Q406	A-3
Q407	A-3
Q500	I-6
Q520	E-8
Q800	D-2
Q802	E-3
Q850	F-6
Q851	F-7
Q922	C-8
Q923	E-7
Q924	C-9
Q956	D-9
Q961	E-7
Q962	E-8
Q964	E-9
Q966	D-9

DIODE

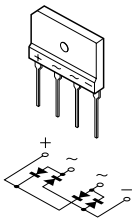
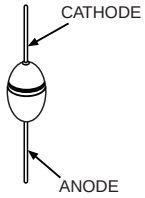
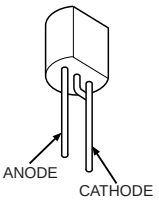
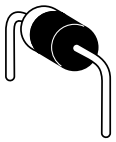
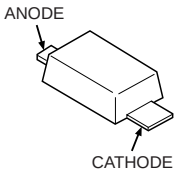
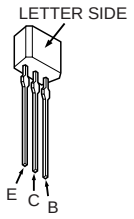
D001	I-13
D002	C-10
D003	H-13
D004	C-12
D005	I-13
D006	E-12
D007	D-9
D008	E-11
D009	I-13
D100	E-4
D101	C-10
D102	C-10
D103	E-7
D104	D-1
D200	B-11
D201	F-12
D202	B-10
D203	B-10
D300	B-10
D301	B-5
D302	C-8
D303	D-8
D304	C-10
D305	C-7
D306	D-9
D307	D-9
D308	D-7
D309	D-6
D310	E-6
D312	E-5
D314	E-6
D315	D-5
D316	D-9
D317	F-5
D318	C-10
D319	D-7
D320	C-7
D321	D-7
D322	D-5
D323	C-7
D324	D-4
D325	D-5
D326	C-8
D327	C-10
D328	D-7
D400	C-10
D401	B-9
D402	B-2
D403	C-2
D404	B-1
D405	B-1
D406	B-1
D407	A-3
D408	A-3
D409	B-2
D410	B-9
D500	H-6
D501	H-5
D502	J-4
D503	I-3
D504	I-4
D520	E-7
D521	D-8
D522	J-5
D553	I-6
D600	I-8
D602	I-9
D603	I-9
D604	I-8
D605	I-8
D606	H-8
D607	G-8
D608	G-7
D609	F-9
D800	E-2
D802	F-4
D803	F-4
D804	F-2
D805	E-3
D851	F-1
D853	G-6
D854	H-6
D961	E-7
D963	E-8
D964	E-8
D965	D-8

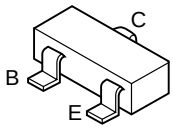
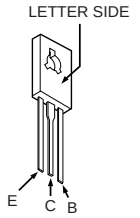
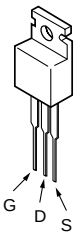
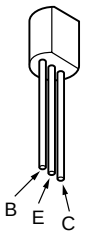
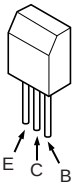
5-7. SEMICONDUCTORS

DIODE

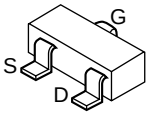
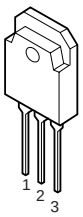
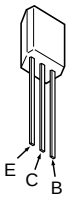
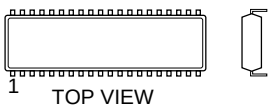
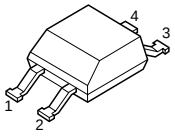
					
D1NL20U D3S6M-F ELIZ EG01CV1 HZS361-TE GPO8D	EGP20G NNCD8.2A-T1 NNCD9.1A-T1 RU4AM-T3 1SS119-25	RD5.6ESB2 RD5.1SB-T2 UDZSTE-179.1B 1SS355TE-17 RD5.6SB-T1	RD2.2ES-B2 RD15ES-B1 S3L20UF4 RD13SB2	SPB-25MVWF	DA204K

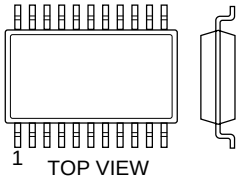
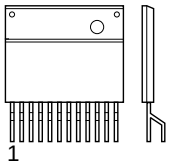
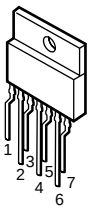
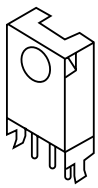
TRANSISTOR

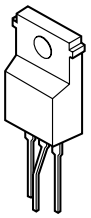
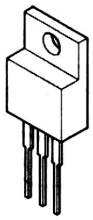
					
D3SB60F3	BY228	UPC574J	RN4Z	MA77	2SC2785-HFE

					
DTC144EKA MSD601-RT1 MSB709-RT1 UN2211 UN2213 UN2216	2SA1162-G	2SC2611	IRF614-005	2SC3779C	2SC3209LK

IC

			DIP  Dual In-line Package Pin 6～98	
2SK208-GR-TE85L	2SD2624-CA	2SA1091-0	M24C08-BN6 (A)(8 PIN) CXP85224A-080S (64 PIN) CXP85220A-083S (64 PIN) TDA7438D013TR (28 PIN)	PC123F2

SOP  Small Outline L-Leaded Pin 8～98	MARKING SIDE VIEW  Zig-zag In -line Package Pin 6～99	 	
MM1319AFBE (7 PIN) NJM2903M (8 PIN)	TDA8844 TDA8843 STR-F6707A	AN5522	SBX3081-21

	
SE-135N	TA7805S

SECTION 6
EXPLODED VIEWS

NOTE:

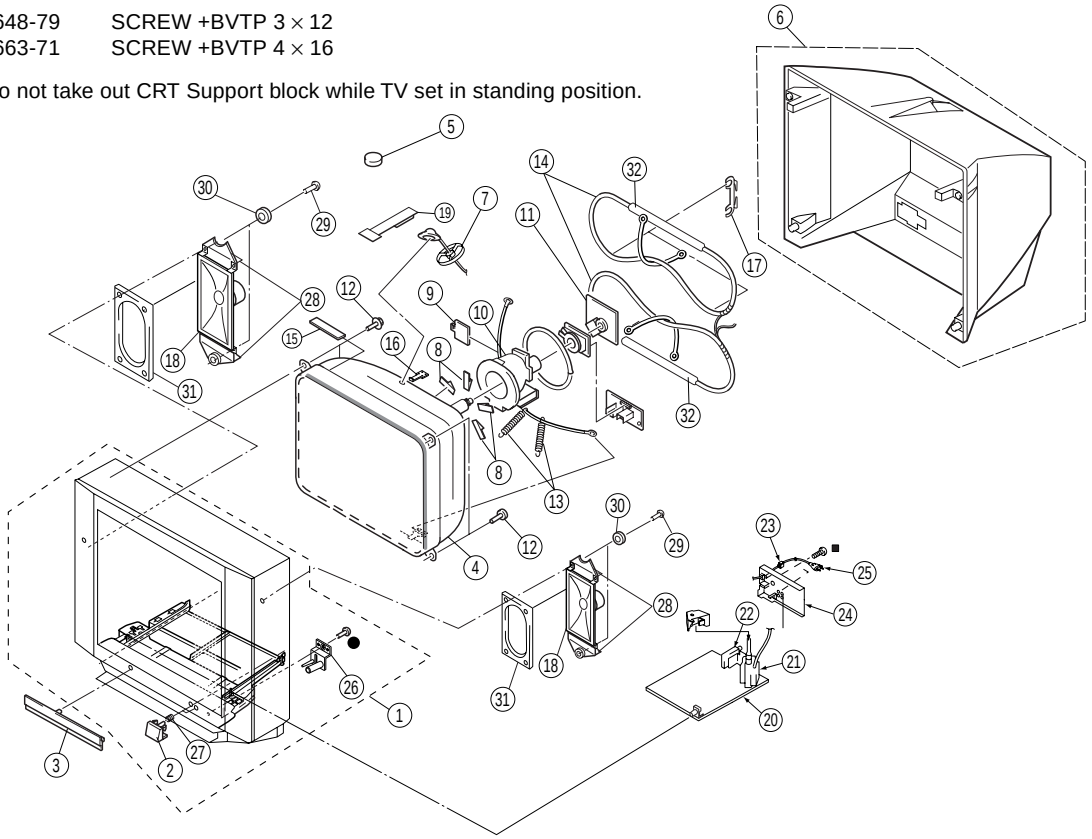
- Items with no part number and no description are not stocked because they are seldom required for routine service.
- The construction parts of an assembled part are indicated with a collation number in the remark column.
- Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

The components identified by shading and mark ⚠ are critical for safety.
Replace only with part number specified.

6-1. PICTURE TUBE AND CHASSIS

● : 7-685-648-79 SCREW +BVTP 3 × 12
■ : 7-685-663-71 SCREW +BVTP 4 × 16

Caution : Do not take out CRT Support block while TV set in standing position.



REF. NO.		PART NO.	DESCRIPTION	REMARK
1		X-4039-609-1	BEZNET ASSY (KV-HA21M80)	2,27,28
		X-4039-846-1	BEZNET ASSY (KV-HA21N70)	
		X-4039-804-1	BEZNET ASSY (KV-HA21N80)	
2		4-083-943-01	BUTTON POWER	
3		X-4039-851-1	DOOR ASSY, CONTROL (KV-HA21M80)	
		X-4039-866-1	DOOR ASSY, CONTROL (KV-HA21N70/HA21N80)	
4	⚠	8-738-809-05	PICTURE TUBE (A51LPT70X) (KV-HA21N70/HA21M80)	
	⚠	8-738-812-05	PICTURE TUBE (A51LPT70X) (KV-HA21N80)	
5		1-452-032-00	MAGNET, DISC	
6		X-4039-650-1	COVER ASSY REAR	
7	*	3-704-372-41	HOLDER HV CABLE (KV-HA21M80)	
	*	3-704-372-11	HOLDER HV CABLE (KV-HA21N70/HA21N80)	
8		4-046-600-11	SPACER DY	
9		4-057-714-01	PIECE TLH CONVERGENCE	
10	⚠	8-451-505-11	DEFLECTION YOKE (Y21RSA-S)	
11	*	A-1332-270-A	CV BOARD MOUNTED (KV-HA21M80)	
	*	A-1332-200-A	CV BOARD MOUNTED (KV-HA21N70/HA21N80)	
12		4-057-862-01	SCREW, TAPPING 5 + CROWN WASHER	
13		4-369-318-61	SPRING TENSION (KV-HA21M80)	
		4-078-765-01	SPRING EXTENSION (KV-HA21N70/HA21N80)	
14	⚠	1-416-946-11	COIL DEGAUSSING (KV-HA21M80)	
	⚠	1-416-946-11	COIL, DEMAGNETIC (KV-HA21N70/HA21N80)	
15		4-069-652-51	CUSHION (HS BAND) (KV-HA21M80)	
		4-069-652-02	CUSHION (HS BAND) (KV-HA21N70/HA21N80)	
16		4-034-272-11	PLATE CORRECTION TLV	
17		4-064-883-03	HOLDER DGC	
18		1-825-039-11	SPEAKER (15 × 6.5CM)	
19		4-051-736-42	PIECE A (90) CONV CORRECT	
20	*	A-1300-229-A	A BOARD COMPLETE (KV-HA21M80)	
	*	A-1300-201-A	A BOARD COMPLETE (KV-HA21N70)	
	*	A-1300-151-A	A BOARD COMPLETE (KV-HA21N80)	
21	⚠	1-453-329-21	TRANSFORMER ASSY FLY BACK (NX-4751//M3A4)	
22		8-598-590-00	TUNER BTP-AA401	
23		4-022-115-21	HOLDER AC CORD (KV-HA21M80)	
		4-022-115-00	HOLDER AC CORD (KV-HA21N70/HA21N80)	
24	*	4-083-951-01	BRACKET TERMINAL (KV-HA21M80)	
	*	4-083-951-11	BRACKET TERMINAL (KV-HA21N70/HA21N80)	
25	⚠	1-574-062-11	CORD POWER WITH CONNECTOR (KV-HA21M80)	
	⚠	1-823-484-11	CORD POWER (WITH CONNECTOR) (KV-HA21N70/HA21N80)	
26	*	4-083-944-01	BAR OPTICAL	
27		4-036-405-11	SPRING COMPRESSION	
28	*	4-046-981-01	BRACKET SPEAKER	
29		4-302-404-03	SCREW (WASHER HEAD)(+P 4 × 16)	
30		4-374-745-21	CUSHION (A) (KV-HA21N70/HA21N80)	
31	*	4-069-797-31	CUSHION SPEAKER (S) (KV-HA21M80)	
	*	4-069-797-01	CUSHION SPEAKER (S) (KV-HA21N70/HA21N80)	
32	*	4-069-653-51	CUSHION, DGC (KV-HA21M80)	

SECTION 7
ELECTRICAL PARTS LIST

NOTE:

The components identified by shading and mark ⚠ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board name.

- Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- All resistors are in ohms
- F : nonflammable

CAPACITORS
- MF : µF, PF : µµF

COILS
- MMH : mH, UH : µH

REF NO.	PART NO.	DESCRIPTION			REMARK
*	A-1300-229-A	A BOARD COMPLETE (KV-HA21M80)			
*	A-1300-201-A	A BOARD COMPLETE (KV-HA21N70)			
*	A-1300-151-A	A BOARD COMPLETE (KV-HA21N80)			
		**********			
	1-533-223-11	CLIP, FUSE			
*	4-055-304-01	HOLDER, LED			
	4-082-405-01	HOLDER, FBT			
*	4-374-846-01	COVER, CAPACITOR, CAP TYPE (KV-HA21M80)			
	4-382-854-01	SCREW (M3X8), P, SW (+)			
	4-382-854-11	SCREW (M3X10), P, SW (+)			
	4-382-854-21	SCREW (M3X14), P, SW (+)			
	7-685-648-79	SCREW +BVTP 3X12 TYPE2 N-S			
		<CAPACITOR>			
C001	1-162-962-11	CERAMIC CHIP	470PF	10.00%	50V
C002	1-162-962-11	CERAMIC CHIP	470PF	10.00%	50V
C004	1-162-964-11	CERAMIC CHIP	0.001UF	10.00%	50V
C005	1-162-964-11	CERAMIC CHIP	0.001UF	10.00%	50V
C006	1-162-964-11	CERAMIC CHIP	0.001UF	10.00%	50V
C007	1-162-964-11	CERAMIC CHIP	0.001UF	10.00%	50V
C009	1-162-964-11	CERAMIC CHIP	0.001UF	10.00%	50V
C010	1-162-927-11	CERAMIC CHIP	100PF	5.00%	50V
C011	1-162-927-11	CERAMIC CHIP	100PF	5.00%	50V
C012	1-162-964-11	CERAMIC CHIP	0.001UF	10.00%	50V
C013	1-162-964-11	CERAMIC CHIP	0.001UF	10.00%	50V
C014	1-162-964-11	CERAMIC CHIP	0.001UF	10.00%	50V
C015	1-162-964-11	CERAMIC CHIP	0.001UF	10.00%	50V
C016	1-162-927-11	CERAMIC CHIP	100PF	5.00%	50V
C017	1-125-796-91	ELECT	47UF	20.00%	16V
C018	1-125-800-91	ELECT (KV-HA21M80)	2.2UF	20.00%	63V
C018	1-126-961-11	ELECT (KV-HA21N70/HA21N80)	2.2UF	20.00%	50V
C019	8-719-036-94	RD5.6SB-T1			
C020	1-162-962-11	CERAMIC CHIP	470PF	10.00%	50V
C021	1-162-964-11	CERAMIC CHIP	0.001UF	10.00%	50V
C022	1-162-927-11	CERAMIC CHIP	100PF	5.00%	50V
C023	1-162-927-11	CERAMIC CHIP	100PF	5.00%	50V
C024	1-162-964-11	CERAMIC CHIP	0.001UF	10.00%	50V
C025	1-135-834-91	CERAMIC CHIP	2.2E+06PF		6.3V
C026	1-162-964-11	CERAMIC CHIP (KV-HA21M80)	0.001UF	10.00%	50V
C027	1-162-964-11	CERAMIC CHIP (KV-HA21M80)	0.001UF	10.00%	50V
C028	1-162-927-11	CERAMIC CHIP	100PF	5.00%	50V
C029	1-162-927-11	CERAMIC CHIP	100PF	5.00%	50V
C030	1-162-927-11	CERAMIC CHIP	100PF	5.00%	50V
C031	1-162-927-11	CERAMIC CHIP	100PF	5.00%	50V
C032	1-162-965-11	CERAMIC CHIP	0.0015UF	10.00%	50V
C033	1-162-927-11	CERAMIC CHIP	100PF	5.00%	50V
C034	1-162-964-11	CERAMIC CHIP	0.001UF	10.00%	50V
C035	1-162-964-11	CERAMIC CHIP	0.001UF	10.00%	50V
C036	1-163-038-91	CERAMIC CHIP	0.1UF		25V
C037	1-162-927-11	CERAMIC CHIP	100PF	5.00%	50V
C038	1-162-927-11	CERAMIC CHIP	100PF	5.00%	50V
C039	1-163-038-91	CERAMIC CHIP	0.1UF		25V
C041	1-162-924-11	CERAMIC CHIP	56PF	5.00%	50V
C042	1-162-927-11	CERAMIC CHIP	100PF	5.00%	50V
C043	1-162-927-11	CERAMIC CHIP	100PF	5.00%	50V
C044	1-162-924-11	CERAMIC CHIP	56PF	5.00%	50V
C045	1-126-962-11	ELECT (KV-HA21M80)	3.3UF	20.00%	63V
C045	1-126-962-11	ELECT (KV-HA21N70/HA21N80)	3.3UF	20.00%	50V
C046	1-162-995-11	CERAMIC CHIP	0.022UF		50V
C047	1-113-619-11	CERAMIC CHIP	0.47UF		10V
C048	1-126-965-11	ELECT	22UF	20%	50V
C049	1-163-038-91	CERAMIC CHIP	0.1UF		25V
C050	1-162-964-11	CERAMIC CHIP	0.001UF	10.00%	50V
C051	1-163-038-91	CERAMIC CHIP	0.1UF		25V
C052	1-126-941-11	ELECT	470UF	20%	10V
C053	1-126-941-11	ELECT	470UF	20%	10V
C054	1-104-666-11	ELECT	220UF	20.00%	25V
C055	1-162-960-11	CERAMIC CHIP	220PF	10.00%	50V
C056	1-162-927-11	CERAMIC CHIP	100PF	5.00%	50V
C057	1-162-960-11	CERAMIC CHIP	220PF	10.00%	50V
C058	1-162-960-11	CERAMIC CHIP	220PF	10.00%	50V
C061	1-162-966-11	CERAMIC CHIP	0.0022UF	10.00%	50V
C063	1-162-923-11	CERAMIC CHIP	47PF	5.00%	50V
C100	1-162-964-11	CERAMIC CHIP	0.001UF	10.00%	50V
C101	1-125-797-91	ELECT	10UF	20.00%	50V
C102	1-163-038-91	CERAMIC CHIP (KV-HA21M80)	0.1UF		25V
C103	1-163-038-91	CERAMIC CHIP (KV-HA21M80)	0.1UF		25V
C104	1-163-038-91	CERAMIC CHIP (KV-HA21M80)	0.1UF		25V
C105	1-163-038-91	CERAMIC CHIP (KV-HA21M80)	0.1UF		25V
C106	1-162-968-11	CERAMIC CHIP	0.0047UF	10.00%	50V
C107	1-126-935-11	ELECT	470UF	20%	16V
C108	1-126-767-11	ELECT	1000UF	20.00%	16V
C109	1-163-017-00	CERAMIC CHIP	0.0047UF	10.00%	50V
C111	1-162-922-11	CERAMIC CHIP (KV-HA21N70/HA21N80)	39PF	5.00%	50V
C111	1-162-970-11	CERAMIC CHIP (KV-HA21M80)	0.01UF	10.00%	25V
C115	1-216-295-91	SHORT	0 (KV-HA21N70/HA21N80)		
C115	1-162-968-11	CERAMIC CHIP (KV-HA21M80)	0.0047UF	10.00%	50V
C116	1-162-968-11	CERAMIC CHIP	0.0047UF	10.00%	50V
C117	1-162-924-11	CERAMIC CHIP (KV-HA21M80 ONLY)	56PF	5.00%	50V

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REF NO.	PART NO.	DESCRIPTION		REMARK	
C121	1-162-927-11	CERAMIC CHIP	100PF	5.00%	50V
C122	1-162-915-11	CERAMIC CHIP	10PF	0.50PF	50V
C124	1-130-493-00	MYLAR	0.068UF	5	50V
		(KV-HA21M80 ONLY)			
C125	1-130-495-00	MYLAR	0.1UF	5.00%	50V
		(KV-HA21M80 ONLY)			
C126	1-130-493-00	MYLAR	0.068UF	5	50V
		(KV-HA21M80 ONLY)			
C127	1-162-927-11	CERAMIC CHIP	100PF	5.00%	50V
		(KV-HA21M80 ONLY)			
C128	1-126-965-11	ELECT	22UF	20%	50V
C129	1-162-970-11	CERAMIC CHIP	0.01UF	10.00%	25V
C130	1-126-933-11	ELECT	100UF	20.00%	16V
		(KV-HA21N70/HA21N80)			
C131	1-162-966-11	CERAMIC CHIP	0.0022UF	10.00%	50V
C200	1-163-037-11	CERAMIC CHIP	0.022UF	10.00%	50V
		(KV-HA21M80/HA21N80)			
C200	1-162-970-11	CERAMIC CHIP	0.01UF	10.00%	25V
		(KV-HA21N70)			
C201	1-163-037-11	CERAMIC CHIP	0.022UF	10.00%	50V
		(KV-HA21M80/HA21N80)			
C201	1-162-970-11	CERAMIC CHIP	0.01UF	10.00%	25V
		(KV-HA21N70)			
C202	1-130-471-00	MYLAR	0.001UF	5.00%	50V
		(KV-HA21M80/HA21N80)			
C202	1-136-169-00	FILM	0.22UF	5.00%	50V
		(KV-HA21N70)			
C203	1-126-961-11	ELECT	2.2UF	20.00%	50V
C204	1-136-169-00	FILM	0.22UF	5.00%	50V
		(KV-HA21N70)			
C204	1-130-471-00	MYLAR	0.001UF	5.00%	50V
		(KV-HA21M80/HA21N80)			
C205	1-125-800-91	ELECT	2.2UF	20.00%	63V
		(KV-HA21M80)			
C205	1-126-961-11	ELECT	2.2UF	20.00%	50V
		(KV-HA21N70/HA21N80)			
C206	1-126-968-11	ELECT	100UF	20.00%	50V
C207	1-126-942-61	ELECT	1000UF	20.00%	25V
C208	1-126-965-11	ELECT	22UF	20.00%	25V
C209	1-126-942-61	ELECT	1000UF	20.00%	25V
C210	1-126-965-11	ELECT	22UF	20.00%	25V
C211	1-126-959-11	ELECT	0.47UF	20.00%	50V
C213	1-162-970-11	CERAMIC CHIP	0.01UF	10.00%	25V
C214	1-107-725-11	CERAMIC CHIP	0.1UF	10.00%	16V
		(KV-HA21M80/HA21N80)			
C215	1-107-725-11	CERAMIC CHIP	0.1UF	10.00%	16V
		(KV-HA21M80/HA21N80)			
C216	1-107-725-11	CERAMIC CHIP	0.1UF	10.00%	16V
		(KV-HA21M80/HA21N80)			
C217	1-164-227-11	CERAMIC CHIP	0.022UF	10.00%	16V
		(KV-HA21M80/HA21N80)			
C218	1-107-725-11	CERAMIC CHIP	0.1UF	10.00%	16V
		(KV-HA21M80/HA21N80)			
C219	1-104-509-11	CERAMIC CHIP	0.018UF	10.00%	16V
		(KV-HA21M80/HA21N80)			
C220	1-164-227-11	CERAMIC CHIP	0.022UF	10.00%	16V
		(KV-HA21M80/HA21N80)			
C221	1-162-968-11	CERAMIC CHIP	0.0047UF	10.00%	50V
		(KV-HA21M80/HA21N80)			
C222	1-104-509-11	CERAMIC CHIP	0.018UF	10.00%	16V
		(KV-HA21M80/HA21N80)			
C223	1-162-968-11	CERAMIC CHIP	0.0047UF	10.00%	50V
		(KV-HA21M80/HA21N80)			
C224	1-126-960-11	ELECT	1PF	20%	50V
		(KV-HA21M80/HA21N80)			
C225	1-126-960-11	ELECT	1PF	20%	50V
		(KV-HA21M80/HA21N80)			

REF NO.	PART NO.	DESCRIPTION		REMARK	
C226	1-125-805-91	ELECT	4.7UF	20.00%	50V
		(KV-HA21M80/HA21N80)			
C227	1-126-947-11	ELECT	47UF	20.00%	16V
		(KV-HA21M80/HA21N80)			
C228	1-126-960-11	ELECT	1PF	20%	50V
		(KV-HA21M80/HA21N80)			
C229	1-126-959-11	ELECT	0.47UF	20.00%	50V
		(KV-HA21M80/HA21N80)			
C230	1-135-834-91	CERAMIC CHIP	2.2E+06PF		6.3V
		(KV-HA21M80/HA21N80)			
C231	1-135-834-91	CERAMIC CHIP	2.2E+06PF		6.3V
		(KV-HA21M80/HA21N80)			
C232	1-135-834-91	CERAMIC CHIP	2.2E+06PF		6.3V
		(KV-HA21M80/HA21N80)			
C234	1-107-823-11	CERAMIC CHIP	0.47UF	10.00%	16V
C236	1-126-959-11	ELECT	0.47UF	20.00%	50V
C237	1-125-808-91	ELECT	470UF	20.00%	35V
C238	1-126-961-11	ELECT	2.2UF	20.00%	50V
		(KV-HA21N70)			
C240	1-135-834-91	CERAMIC CHIP	2.2E+06PF		6.3V
		(KV-HA21M80/HA21N80)			
C241	1-162-968-11	CERAMIC CHIP	0.0047UF	10.00%	50V
		(KV-HA21M80)			
C241	1-163-020-00	CERAMIC CHIP	0.0082UF	10.00%	50V
		(KV-HA21N70)			
C241	1-162-965-11	CERAMIC CHIP	0.0015UF	10.00%	50V
		(KV-HA21N80)			
C242	1-162-968-11	CERAMIC CHIP	0.0047UF	10.00%	50V
		(KV-HA21M80)			
C242	1-163-023-00	CERAMIC CHIP	0.015UF	10.00%	50V
		(KV-HA21N70/HA21N80)			
C243	1-126-952-11	ELECT	1000UF	20.00%	35V
C300	1-162-923-11	CERAMIC CHIP	47PF	5.00%	50V
		(KV-HA21M80)			
C301	1-162-920-11	CERAMIC CHIP	27PF	5.00%	50V
		(KV-HA21M80)			
C302	1-163-094-00	CERAMIC CHIP	11PF	5.00%	50V
		(KV-HA21N70/HA21N80)			
C302	1-162-923-11	CERAMIC CHIP	47PF	5.00%	50V
		(KV-HA21M80)			
C303	1-162-925-11	CERAMIC CHIP	68PF	5.00%	50V
		(KV-HA21M80)			
C303	1-163-112-00	CERAMIC CHIP	62PF	5.00%	50V
		(KV-HA21N70/HA21N80)			
C304	1-119-662-91	CERAMIC CHIP	150PF	1.00%	50V
C305	1-126-933-11	ELECT	100UF	20.00%	16V
C306	1-162-968-11	CERAMIC CHIP	0.0047UF	10.00%	50V
C307	1-126-961-11	ELECT	2.2UF	20.00%	50V
		(KV-HA21N70)			
C308	1-163-131-00	CERAMIC CHIP	390PF	5.00%	50V
		(KV-HA21M80)			
C309	1-163-263-11	CERAMIC CHIP	330PF	5.00%	50V
		(KV-HA21M80)			
C310	1-163-131-00	CERAMIC CHIP	390PF	5.00%	50V
		(KV-HA21M80)			
C311	1-162-962-11	CERAMIC CHIP	470PF	10.00%	50V
C312	1-162-916-11	CERAMIC CHIP	12PF	5.00%	50V
C315	1-125-800-91	ELECT	2.2UF	20.00%	63V
		(KV-HA21M80)			
C315	1-126-961-11	ELECT	2.2UF	20.00%	50V
		(KV-HA21N70/HA21N80)			
C316	1-162-923-11	CERAMIC CHIP	47PF	5.00%	50V
		(KV-HA21M80)			
C317	1-216-295-91	SHORT	0		
C318	1-163-038-91	CERAMIC CHIP	0.1UF		25V
C319	1-163-038-91	CERAMIC CHIP	0.1UF		25V
C320	1-163-038-91	CERAMIC CHIP	0.1UF		25V

The components identified by shading and mark ⚠ are critical for safety.
Replace only with part number specified.

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REF NO.	PART NO.	DESCRIPTION		REMARK	
C321	1-125-805-91	ELECT	4.7UF	20.00%	50V
C323	1-162-927-11	CERAMIC CHIP	100PF	5.00%	50V
C327	1-163-038-91	CERAMIC CHIP	0.1UF		25V
C328	1-164-222-91	CERAMIC CHIP	0.22UF		25V
C329	1-163-038-91	CERAMIC CHIP	0.1UF		25V
C330	1-163-038-91	CERAMIC CHIP	0.1UF		25V
C332	1-126-933-11	ELECT	100UF	20.00%	16V
C335	1-125-796-91	ELECT	47UF	20.00%	16V
C337	1-163-038-91	CERAMIC CHIP	0.1UF		25V
C339	1-163-038-91	CERAMIC CHIP	0.1UF		25V
C341	1-163-038-91	CERAMIC CHIP (KV-HA21N70)	0.1UF		25V
C342	1-163-038-91	CERAMIC CHIP	0.1UF		25V
C343	1-162-917-11	CERAMIC CHIP	15PF	5.00%	50V
C344	1-163-098-00	CERAMIC CHIP (KV-HA21M80)	16PF	5.00%	50V
C344	1-162-917-11	CERAMIC CHIP (KV-HA21N70/HA21N80)	15PF	5.00%	50V
C345	1-162-967-11	CERAMIC CHIP	0.0033UF	10.00%	50V
C346	1-163-038-91	CERAMIC CHIP	0.1UF		25V
C347	1-126-933-11	ELECT	100UF	20.00%	16V
C348	1-163-038-91	CERAMIC CHIP	0.1UF		25V
C349	1-164-346-11	CERAMIC CHIP	1UF		16V
C352	1-162-966-11	CERAMIC CHIP	0.0022UF	10.00%	50V
C353	1-107-823-11	CERAMIC CHIP	0.47UF	10.00%	16V
C354	1-162-968-11	CERAMIC CHIP	0.0047UF	10.00%	50V
C355	1-107-823-11	CERAMIC CHIP	0.47UF	10.00%	16V
C356	1-162-970-11	CERAMIC CHIP	0.01UF	10.00%	25V
C357	1-162-964-11	CERAMIC CHIP	0.001UF	10.00%	50V
C358	1-162-927-11	CERAMIC CHIP	100PF	5.00%	50V
C359	1-163-038-91	CERAMIC CHIP	0.1UF		25V
C360	1-136-165-00	FILM	0.1UF	5.00%	50V
C361	1-135-834-91	CERAMIC CHIP	2.2E+06PF		6.3V
C362	1-113-619-11	CERAMIC CHIP	0.47UF		10V
C363	1-162-968-11	CERAMIC CHIP	0.0047UF	10.00%	50V
C364	1-125-797-91	ELECT	10UF	20.00%	50V
C366	1-126-933-11	ELECT	100UF	20.00%	16V
C369	1-137-194-81	FILM	0.47UF	5.00%	50V
C370	1-216-295-91	SHORT	0		
C371	1-125-797-91	ELECT	10UF	20.00%	50V
C400	1-126-934-11	ELECT	220UF	20.00%	16V
C403	1-115-156-11	CERAMIC CHIP (KV-HA21M80/HA21N80)	1UF		10V
C404	1-126-960-11	ELECT (KV-HA21M80/HA21N80)	1PF	20%	50V
C405	1-126-960-11	ELECT	1PF	20%	50V
C406	1-115-156-11	CERAMIC CHIP	1UF		10V
C407	1-126-934-11	ELECT	220UF	20.00%	16V
C408	1-163-038-91	CERAMIC CHIP (KV-HA21M80/HA21N80)	0.1UF		25V
C409	1-163-038-91	CERAMIC CHIP	0.1UF		25V
C410	1-126-933-11	ELECT	100UF	20.00%	16V
C411	1-163-038-91	CERAMIC CHIP (KV-HA21M80/HA21N80)	0.1UF		25V
C412	1-126-965-11	ELECT	22UF	20.00%	25V
C414	1-163-038-91	CERAMIC CHIP	0.1UF		25V
C418	1-126-933-11	ELECT	100UF	20.00%	16V
C419	1-126-964-11	ELECT (KV-HA21N70)	10UF	20.00%	50V
C421	1-126-964-11	ELECT (KV-HA21N70)	10UF	20.00%	50V
C422	1-126-964-11	ELECT (KV-HA21N70)	10UF	20.00%	50V

REF NO.		PART NO.	DESCRIPTION		REMARK	
C425		1-162-925-11	CERAMIC CHIP	68PF	5.00%	50V
C426		1-162-925-11	CERAMIC CHIP (KV-HA21M80/HA21N80)	68PF	5.00%	50V
C430		1-126-964-11	ELECT (KV-HA21N70)	10UF	20.00%	50V
C435		1-126-934-11	ELECT	220UF	20.00%	16V
C500		1-126-933-11	ELECT	100UF	20.00%	16V
C501		1-104-666-11	ELECT	220UF	20.00%	25V
C502		1-104-666-11	ELECT	220UF	20.00%	25V
C503		1-162-318-11	CERAMIC	0.001UF	10.00%	500V
C504		1-162-318-11	CERAMIC	0.001UF	10.00%	500V
C505		1-123-024-21	ELECT	33UF		160V
C507		1-102-228-00	CERAMIC	470PF	10.00%	500V
C508		1-107-654-11	ELECT	33UF	20.00%	250V
C509		1-106-379-12	MYLAR	0.033UF	10.00%	200V
C510		1-137-150-11	MYLAR	0.01UF	10.00%	100V
C552		1-137-194-81	FILM	0.47UF	5.00%	50V
C554		1-163-035-00	CERAMIC CHIP	0.047UF		50V
C555		1-126-949-11	ELECT	220UF	20.00%	35V
C556		1-163-038-91	CERAMIC CHIP	0.1UF		25V
C557		1-126-948-11	ELECT	100UF	20%	35V
C558		1-162-964-11	CERAMIC CHIP	0.001UF	10.00%	50V
C559		1-106-220-00	MYLAR	0.1UF	10.00%	100V
C561		1-162-968-11	CERAMIC CHIP	0.0047UF	10.00%	50V
C562		1-106-220-00	MYLAR	0.1UF	10.00%	100V
C600		1-161-830-00	CERAMIC	0.0047UF	99%	500V
C601	⚠	1-115-165-11	FILM	0.1UF	20.00%	275V
C602		1-117-752-11	ELECT(BLOCK)	330UF	20.00%	450V
C603		1-117-623-11	FILM	1500PF	3.00%	1.2KV
C604		1-161-830-00	CERAMIC	0.0047UF	99%	500V
C605		1-161-830-00	CERAMIC	0.0047UF	99%	500V
C606		1-104-666-11	ELECT	220UF	20.00%	25V
C607		1-161-830-00	CERAMIC	0.0047UF	99%	500V
C608		1-161-830-00	CERAMIC	0.0047UF	99%	500V
C609		1-162-962-11	CERAMIC CHIP	470PF	10.00%	50V
C610		1-165-740-31	ELECT	150UF	20%	35V
C611		1-163-145-00	CERAMIC CHIP	0.0015UF	5.00%	50V
C612	⚠	1-119-886-51	CERAMIC	470PF	10.00%	250V
C613		1-102-228-00	CERAMIC	470PF	10.00%	500V
C614		1-123-024-21	ELECT	33UF		160V
C615		1-102-228-00	CERAMIC	470PF	10.00%	500V
C617		1-126-942-61	ELECT	1000UF	20.00%	25V
C618		1-126-933-11	ELECT	100UF	20.00%	16V
C619	⚠	1-119-886-51	CERAMIC	470PF	10.00%	250V
C620		1-162-134-11	CERAMIC	470PF	10.00%	2KV
C621	⚠	1-117-703-41	CERAMIC	0.0047UF	99%	250V
C626		1-106-383-00	MYLAR	0.047UF	10.00%	200V
C627		1-126-953-11	ELECT	2200UF	20.00%	35V
C628		1-162-962-11	CERAMIC CHIP	470PF	10.00%	50V
C800		1-126-960-11	ELECT	1PF	20%	50V
C801		1-162-964-11	CERAMIC CHIP	0.001UF	10.00%	50V
C802		1-106-375-12	MYLAR	0.022UF	99%	200V
C803		1-102-244-00	CERAMIC	220PF	10.00%	500V
C804		1-162-318-11	CERAMIC	0.001UF	10.00%	500V
C807		1-162-115-00	CERAMIC	330PF	10.00%	2KV
C808		1-106-365-00	MYLAR	0.0082UF	10.00%	200V
C809		1-107-364-11	MYLAR	0.01UF	10.00%	200V
C810		1-106-375-12	MYLAR	0.022UF	99%	200V
C811		1-107-957-11	ELECT	1UF	20.00%	250V
C812		1-117-665-11	FILM	0.33UF	5.00%	250V
C813		1-162-115-00	CERAMIC	330PF	10.00%	2KV

A

REF NO.		PART NO.	DESCRIPTION			REMARK
C814		1-117-646-11	FILM	12000PF	3.00%	1.2KV
C852		1-107-846-11	FILM	0.1UF	5.00%	250V
C856		1-162-964-11	CERAMIC CHIP	0.001UF	10.00%	50V
C857		1-125-797-91	ELECT	10UF	20.00%	50V
C858		1-162-974-11	CERAMIC CHIP	0.01UF		50V
C859		1-162-974-11	CERAMIC CHIP	0.01UF		50V
C860		1-208-834-11	METAL CHIP	150K	0.5%	1/10W
C861		1-130-202-00	FILM	0.022UF	5.00%	400V
C863		1-216-295-91	SHORT	0		
C865		1-126-933-11	ELECT	100UF	20.00%	16V
C866		1-162-974-11	CERAMIC CHIP	0.01UF		50V
C867		1-162-966-11	CERAMIC CHIP	0.0022UF	10.00%	50V
C868		1-162-995-11	CERAMIC CHIP	0.022UF		50V
C869		1-115-339-11	CERAMIC CHIP	0.1UF	10.00%	50V
C870		1-162-960-11	CERAMIC CHIP	220PF	10.00%	50V
C872		1-163-038-91	CERAMIC CHIP	0.1UF		25V
C873		1-162-974-11	CERAMIC CHIP	0.01UF		50V
C874		1-162-974-11	CERAMIC CHIP	0.01UF		50V
C875		1-163-038-91	CERAMIC CHIP	0.1UF		25V
			<FILTER>			
CF345		1-234-684-21	FILTER, BAND PASS (F4.5C)			
CF355		1-234-686-21	FILTER, BAND PASS (F5.5C) (KV-HA21M80)			
CF360		1-234-689-21	FILTER, BAND PASS (F6.0C) (KV-HA21M80)			
CF365		1-234-691-21	FILTER, BAND PASS (F6.5C) (KV-HA21M80)			
			<CONNECTOR>			
CN003	*	1-508-797-00	PIN, CONNECTOR 4P			
CN200		1-564-507-11	PLUG, CONNECTOR 4P			
CN300		1-564-509-11	PLUG, CONNECTOR 6P			
CN500	*	1-564-508-11	PLUG, CONNECTOR 5P			
CN600	*	1-508-786-00	PIN, CONNECTOR (5MM PITCH) 2P			
CN601	*	1-573-963-11	PIN, CONNECTOR (PC BOARD) 3P			
CN602		1-580-843-11	PIN, CONNECTOR (POWER)			
			<TRIMMER>			
CT131		1-767-774-22	TRAP, CERAMIC (KV-HA21M80)			
CT131		1-249-404-00	CARBON (KV-HA21N70/HA21N80)	82	5%	1/4W
CT139		1-767-775-22	TRAP, CERAMIC (KV-HA21M80)			
CT345		1-795-342-21	TRAP, CERAMIC (T4.5C)			
CT355		1-795-343-21	TRAP, CERAMIC (T55B) (KV-HA21M80)			
CT360		1-795-344-21	TRAP, CERAMIC (T60B) (KV-HA21M80)			
CT365		1-795-345-21	TRAP, CERAMIC (T65B) (KV-HA21M80)			
			<DIODE>			
D001		8-719-083-18	DIODE SPB-25MVWF			
D004		8-719-911-19	1SS119-25			
D005		1-162-318-11	CERAMIC	0.001UF	10.00%	500V
D006		8-719-109-89	RD5.6ESB2			
D007		8-719-159-10	RD5.1SB-T2			
D009		8-719-159-10	RD5.1SB-T2			
D100		8-719-421-40	MA77 (KV-HA21M80)			
D103		8-759-157-40	UPC574J			
D104		8-719-914-42	DA204K			
D200		8-719-914-42	DA204K			

REF NO.	PART NO.	DESCRIPTION	REMARK
D202	8-719-988-61	1SS355TE-17	
D203	8-719-988-61	1SS355TE-17	
D301	8-719-988-61	1SS355TE-17	
D304	8-719-063-66	HZS361-TE	
D305	8-719-988-61	1SS355TE-17	
D306	8-719-109-54	RD2.2ES-B2	
D307	8-719-988-61	1SS355TE-17	
D308	8-719-988-61	1SS355TE-17	
D309	8-719-069-60	UDZSTE-179.1B	
D310	8-719-911-19	1SS119-25	
D311	8-719-070-15	NNCD8.2A-T1	
D312	8-719-069-60	UDZSTE-179.1B	
D314	8-719-908-03	GP08D	
D315	8-719-988-61	1SS355TE-17	
D318	8-719-988-61	1SS355TE-17	
D319	8-719-988-61	1SS355TE-17	
D320	8-719-988-61	1SS355TE-17	
D321	8-719-988-61	1SS355TE-17	
D322	8-719-069-60	UDZSTE-179.1B	
D323	8-719-069-60	UDZSTE-179.1B	
D324	8-719-069-60	UDZSTE-179.1B	
D325	8-719-069-60	UDZSTE-179.1B	
D327	8-719-988-61	1SS355TE-17	
D331	8-719-069-60	UDZSTE-179.1B (KV-HA21M80)	
D332	8-719-069-60	UDZSTE-179.1B (KV-HA21M80)	
D333	8-719-069-60	UDZSTE-179.1B (KV-HA21M80)	
D400	8-719-988-61	1SS355TE-17	
D401	8-719-988-61	1SS355TE-17	
D402	8-719-070-16	NNCD9.1A-T1 (KV-HA21M80/HA21N80)	
D403	8-719-069-60	UDZSTE-179.1B	
D404	8-719-069-60	UDZSTE-179.1B	
D405	8-719-070-16	NNCD9.1A-T1 (KV-HA21M80/HA21N80)	
D406	8-719-069-60	UDZSTE-179.1B	
D407	8-719-069-60	UDZSTE-179.1B	
D408	8-719-069-60	UDZSTE-179.1B (KV-HA21N70)	
D500	8-719-911-19	1SS119-25	
D501	8-719-911-19	1SS119-25	
D502	8-719-302-43	EL1Z	
D503	8-719-302-43	EL1Z	
D504	8-719-302-43	EL1Z	
D552	8-719-908-03	GP08D	
D553	8-719-109-89	RD5.6ESB2	
D600	8-719-030-33	DIODE EG01CV1	
D601	8-719-077-77	D3SB60F3	
D602	8-719-510-73	S3L20UF4	
D603	8-719-110-39	RD15ES-B1	
D604	8-719-063-70	D1NL20U	
D605	8-719-063-70	D1NL20U	
D606	8-719-063-70	D1NL20U	
D607	8-719-027-22	D3S6M-F	
D608	8-719-312-10	RU4AM-T3	
D609	8-719-067-18	RN4Z	
D800	8-719-911-19	1SS119-25	
D802	8-719-908-03	GP08D	
D803	8-719-908-03	GP08D	
D804	8-719-081-00	DIODE BY228/A52A/	
D805	8-719-069-60	UDZSTE-179.1B	
D851	8-719-979-85	EGP20G	
D853	8-719-988-61	1SS355TE-17	
D854	8-719-158-53	RD13SB2	

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

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REF NO.	PART NO.	DESCRIPTION	REMARK
		<CONNECTOR>	
DY1	* 1-580-798-11	CONNECTOR PIN (DY) 6P	
		<FUSE>	
F600	⚠ 1-532-223-41	FUSE, TIME-LAG (BET) 3.15A/250V	
		<FERRITE BEAD>	
FB001	1-469-175-11	INDUCTOR 0UH (KV-HA21M80)	
FB001	1-410-397-21	FERRITE 1.1UH (KV-HA21N70/HA21N80)	
FB100	1-410-396-71	FERRITE 0.45UH	
FB603	1-412-911-31	FERRITE 0UH	
FB604	1-410-397-21	FERRITE 1.1UH	
FB800	1-469-175-11	INDUCTOR 0UH (KV-HA21M80)	
FB800	1-410-397-21	FERRITE 1.1UH (KV-HA21N70/HA21N80)	
		<IC>	
IC001	8-752-925-65	IC CXP85224A-080S (KV-HA21M80)	
IC001	8-752-925-68	IC CXP85220A-083S (KV-HA21N70/HA21N80)	
IC002	8-759-371-21	MM1319AFBE	
IC003	8-759-672-78	M24C08-BN6(A)	
IC004	8-742-225-20	IC SBX3081-21	
IC101	8-759-231-53	TA7805S (KV-HA21N70/HA21N80)	
IC201	8-759-476-86	TDA7438D013TR (KV-HA21M80/HA21N80)	
IC203	6-700-034-01	IC AN5276	
IC301	6-700-146-01	IC TDA8844/N2 (KV-HA21M80)	
IC301	6-700-145-01	IC TDA8843/N2 (KV-HA21N70/HA21N80)	
IC400	6-700-033-01	IC MM1501XNRE (KV-HA21N70	
IC402	8-759-649-89	IC MC4558CD	
IC551	8-759-835-98	IC AN5522	
IC601	8-749-019-42	IC STR-F6707A	
IC602	8-749-920-61	SE-135N	
IC604	8-759-544-13	IC KA78R09TU	
IC850	8-759-700-07	NJM2903M	
IC851	8-759-649-89	IC MC4558CD	
		<JACK>	
J200	1-770-786-11	JACK	
J400	1-779-850-11	JACK BLOCK, PIN 6P (KV-HA21M80/HA21N80)	
J400	1-779-849-11	JACK BLOCK, PIN 4P (KV-HA21N70)	
J401	1-770-329-11	JACK, PIN 3P (KV-HA21M80/HA21N80)	
J401	1-779-205-11	JACK, PIN 2P (KV-HA21N70)	
		<CHIP CONDUCTOR>	
JR001	1-216-295-91	SHORT 0	
JR002	1-216-295-91	SHORT 0 (KV-HA21N70/HA21N80)	
JR003	1-216-295-91	SHORT 0	
JR006	1-216-295-91	SHORT 0 (KV-HA21N70/HA21N80)	
JR013	1-216-295-91	SHORT 0	
JR014	1-216-295-91	SHORT 0	
JR015	1-216-295-91	SHORT 0	
JR016	1-216-295-91	SHORT 0 (KV-HA21M80/HA21N80)	
JR018	1-216-295-91	SHORT 0	
JR020	1-216-295-91	SHORT 0	

REF NO.	PART NO.	DESCRIPTION	REMARK
JR034	1-216-295-91	SHORT	0 (KV-HA21M80)
JR035	1-216-295-91	SHORT	0
JR036	1-216-295-91	SHORT	0
JR100	1-216-295-91	SHORT	0 (KV-HA21N70/HA21N80)
JR202	1-216-295-91	SHORT	0 (KV-HA21N70)
JR205	1-216-295-91	SHORT	0 (KV-HA21M80/HA21N80)
JR210	1-216-295-91	SHORT	0
JR212	1-216-295-91	SHORT	0
JR213	1-216-295-91	SHORT	0 (KV-HA21N70)
JR214	1-216-295-91	SHORT	0
JR301	1-216-295-91	SHORT	0
JR304	1-216-295-91	SHORT	0
JR400	1-216-295-91	SHORT	0 (KV-HA21M80/HA21N80)
		<COIL>	
L001	1-414-855-31	INDUCTOR	1UH
L002	1-414-184-41	INDUCTOR	15UH
L100	1-414-856-11	INDUCTOR	10UH
L101	1-410-498-11	INDUCTOR	1.2UH (KV-HA21M80)
L102	1-410-985-42	INDUCTOR	0.22UH (KV-HA21M80)
L102	1-410-987-42	INDUCTOR	0.33UH (KV-HA21N70/HA21N80)
L103	1-410-987-42	INDUCTOR	0.33UH (KV-HA21M80)
L200	1-249-403-11	CARBON 68 5% 1/4W	(KV-HA21N70/HA21N80)
L200	1-249-401-11	CARBON 47 5% 1/4W	(KV-HA21M80)
L300	1-410-512-11	INDUCTOR	18UH (KV-HA21M80)
L301	1-410-510-11	INDUCTOR	12UH (KV-HA21M80)
L301	1-410-512-11	INDUCTOR	18UH (KV-HA21N70/HA21N80)
L302	1-410-508-11	INDUCTOR	8.2UH (KV-HA21M80)
L303	1-410-508-11	INDUCTOR	8.2UH (KV-HA21M80)
L303	1-410-512-11	INDUCTOR	18UH (KV-HA21N70/HA21N80)
L304	1-410-510-11	INDUCTOR	12UH (KV-HA21M80)
L305	1-410-510-11	INDUCTOR	12UH (KV-HA21M80)
L306	1-410-500-11	INDUCTOR	1.8UH (KV-HA21M80)
L307	1-410-501-11	INDUCTOR	2.2UH (KV-HA21M80)
L308	1-410-501-11	INDUCTOR	2.2UH (KV-HA21M80)
L309	1-410-502-11	INDUCTOR	2.7UH
L310	1-408-608-31	INDUCTOR	27UH (KV-HA21M80)
L400	1-414-187-11	INDUCTOR	47UH
L500	1-408-947-00	INDUCTOR	2.2MH
L600	1-412-533-21	INDUCTOR	47UH
L601	1-414-487-41	INDUCTOR	1UH
L800	1-406-677-11	INDUCTOR	10MH
L802	1-424-796-11	COIL, HORIZONTAL LINEARITY	
L803	1-414-493-41	INDUCTOR	4.7MH
		<PHOTO COUPLER>	
PH600	⚠ 8-749-010-64	PC123F2	
		<IC LINK>	
PS600	1-533-597-41	LINK, IC	
PS601	1-533-597-41	LINK, IC	
PS601	1-533-597-41	LINK, IC	

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REF NO.	PART NO.	DESCRIPTION	REMARK
		<TRANSISTOR>	
Q001	8-729-421-19	UN2213	
Q002	8-729-421-19	UN2213	
Q003	8-729-010-25	MSD601-RT1	
Q004	8-729-010-25	MSD601-RT1	
Q005	8-729-421-19	UN2213	
Q100	8-729-010-25	MSD601-RT1	
Q102	8-729-022-54	TRANSISTOR 2SC3779C,D-AA (KV-HA21M80)	
Q103	8-729-424-67	UN2216 (KV-HA21M80)	
Q104	8-729-424-67	UN2216 (KV-HA21M80)	
Q105	8-729-010-25	MSD601-RT1	
Q106	8-729-010-25	MSD601-RT1 (KV-HA21M80)	
Q201	8-729-010-25	MSD601-RT1	
Q202	8-729-036-56	2SK208-GR-TE85L	
Q203	8-729-010-25	MSD601-RT1	
Q204	8-729-216-22	2SA1162-G	
Q205	8-729-421-22	UN2211	
Q208	1-801-806-11	TR DTC144EKA	
Q300	8-729-010-05	MSB709-RT1 (KV-HA21M80)	
Q301	8-729-010-05	MSB709-RT1 (KV-HA21M80)	
Q302	8-729-010-05	MSB709-RT1	
Q303	8-729-010-25	MSD601-RT1 (KV-HA21M80)	
Q304	8-729-010-05	MSB709-RT1 (KV-HA21M80)	
Q305	8-729-010-05	MSB709-RT1 (KV-HA21M80)	
Q306	8-729-010-25	MSD601-RT1 (KV-HA21M80)	
Q307	8-729-010-25	MSD601-RT1 (KV-HA21M80)	
Q308	8-729-424-67	UN2216 (KV-HA21M80)	
Q309	8-729-010-25	MSD601-RT1 (KV-HA21M80)	
Q310	8-729-424-67	UN2216 (KV-HA21M80)	
Q311	8-729-010-25	MSD601-RT1	
Q312	8-729-424-67	UN2216 (KV-HA21M80)	
Q313	8-729-424-67	UN2216	
Q314	8-729-421-22	UN2211 (KV-HA21M80)	
Q315	8-729-010-25	MSD601-RT1	
Q318	8-729-010-25	MSD601-RT1	
Q320	8-729-421-22	UN2211	
Q321	8-729-424-67	UN2216 (KV-HA21N70/HA21N80)	
Q400	8-729-010-05	MSB709-RT1	
Q401	8-729-424-67	UN2216	
Q402	8-729-424-67	UN2216	
Q403	8-729-010-05	MSB709-RT1	
Q404	8-729-010-05	MSB709-RT1	
Q405	8-729-010-05	MSB709-RT1	
Q406	8-729-010-25	MSD601-RT1	
Q407	8-729-010-25	MSD601-RT1	
Q500	8-729-200-17	2SA1091-O	
Q800	8-729-140-50	2SC3209LK	
Q801	8-729-055-74	TRANSISTOR 2SD2624-CA	
Q802	8-729-050-48	TRANSISTOR IRF614-005	
Q850	8-729-010-25	MSD601-RT1	
Q851	8-729-010-05	MSB709-RT1	

REF NO.	PART NO.	DESCRIPTION			REMARK
		<RESISTOR>			
R001	1-216-071-00	RES-CHIP	8.2K	5%	1/10W
R002	1-216-071-00	RES-CHIP	8.2K	5%	1/10W
R003	1-216-059-00	RES-CHIP	2.7K	5%	1/10W
R004	1-216-059-00	RES-CHIP	2.7K	5%	1/10W
R005	1-216-043-91	RES-CHIP	560	5%	1/10W
R006	1-216-043-91	RES-CHIP	560	5%	1/10W
R007	1-216-065-91	RES-CHIP	4.7K	5%	1/10W
R008	1-216-065-91	RES-CHIP	4.7K	5%	1/10W
R009	1-216-037-00	RES-CHIP	330	5%	1/10W
R010	1-216-037-00	RES-CHIP	330	5%	1/10W
R011	1-216-295-91	SHORT	0		
R012	1-216-049-11	RES-CHIP	1K	5%	1/10W
R013	1-216-021-00	RES-CHIP	68	5%	1/10W
R014	1-216-057-00	RES-CHIP	2.2K	5%	1/10W
R015	1-216-025-11	RES-CHIP	100	5%	1/10W
R016	1-216-037-00	RES-CHIP	330	5%	1/10W
R017	1-216-049-11	RES-CHIP	1K	5%	1/10W
R018	1-216-057-00	RES-CHIP	2.2K	5%	1/10W
R019	1-216-057-00	RES-CHIP	2.2K	5%	1/10W
R020	1-216-057-00	RES-CHIP	2.2K	5%	1/10W
R021	1-216-049-11	RES-CHIP (KV-HA21M80)	1K	5%	1/10W
R022	1-216-049-11	RES-CHIP	1K	5%	1/10W
R024	1-216-025-11	RES-CHIP	100	5%	1/10W
R025	1-216-065-91	RES-CHIP	4.7K	5%	1/10W
R026	1-216-065-91	RES-CHIP	4.7K	5%	1/10W
R027	1-216-101-00	RES-CHIP	150K	5%	1/10W
R028	1-216-057-00	RES-CHIP	2.2K	5%	1/10W
R029	1-216-025-11	RES-CHIP	100	5%	1/10W
R031	1-216-025-11	RES-CHIP	100	5%	1/10W
R032	1-216-049-11	RES-CHIP	1K	5%	1/10W
R033	1-216-073-91	RES-CHIP	10K	5%	1/10W
R034	1-216-057-00	RES-CHIP	2.2K	5%	1/10W
R035	1-216-057-00	RES-CHIP	2.2K	5%	1/10W
R036	1-216-057-00	RES-CHIP	2.2K	5%	1/10W
R037	1-216-049-11	RES-CHIP (KV-HA21M80)	1K	5%	1/10W
R038	1-216-049-11	RES-CHIP (KV-HA21M80)	1K	5%	1/10W
R039	1-216-043-91	RES-CHIP	560	5%	1/10W
R042	1-216-039-00	RES-CHIP	390	5%	1/10W
R043	1-216-025-11	RES-CHIP	100	5%	1/10W
R044	1-216-033-00	RES-CHIP	220	5%	1/10W
R045	1-216-073-91	RES-CHIP	10K	5%	1/10W
R046	1-216-685-11	METAL CHIP	27K	0.5%	1/10W
R047	1-216-025-11	RES-CHIP	100	5%	1/10W
R048	1-216-065-91	RES-CHIP	4.7K	5%	1/10W
R049	1-216-065-91	RES-CHIP	4.7K	5%	1/10W
R050	1-208-820-11	METAL CHIP	39K	0.5%	1/10W
R051	1-216-073-91	RES-CHIP	10K	5%	1/10W
R052	1-216-065-91	RES-CHIP	4.7K	5%	1/10W
R053	1-216-065-91	RES-CHIP	4.7K	5%	1/10W
R054	1-216-065-91	RES-CHIP	4.7K	5%	1/10W
R055	1-216-049-11	RES-CHIP	1K	5%	1/10W
R056	1-216-049-11	RES-CHIP	1K	5%	1/10W
R057	1-216-025-11	RES-CHIP	100	5%	1/10W
R058	1-216-025-11	RES-CHIP	100	5%	1/10W
R059	1-216-033-00	RES-CHIP	220	5%	1/10W
R060	1-216-033-00	RES-CHIP	220	5%	1/10W
R061	1-216-033-00	RES-CHIP	220	5%	1/10W
R062	1-216-049-11	RES-CHIP (KV-HA21M80)	1K	5%	1/10W
R063	1-216-049-11	RES-CHIP (KV-HA21M80)	1K	5%	1/10W
R064	1-216-049-11	RES-CHIP	1K	5%	1/10W
R065	1-216-049-11	RES-CHIP	1K	5%	1/10W
R066	1-216-049-11	RES-CHIP	1K	5%	1/10W
R072	1-216-065-91	RES-CHIP	4.7K	5%	1/10W
R073	1-216-081-00	RES-CHIP	22K	5%	1/10W
R074	1-216-049-11	RES-CHIP	1K	5%	1/10W

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REF NO.	PART NO.	DESCRIPTION		REMARK	
R076	1-216-025-11	RES-CHIP (KV-HA21N70/HA21N80)	100	5%	1/10W
R077	1-216-025-11	RES-CHIP	100	5%	1/10W
R100	1-216-049-11	RES-CHIP	1K	5%	1/10W
R103	1-211-981-11	METAL CHIP	33	0.5%	1/10W
R106	1-216-065-91	RES-CHIP (KV-HA21M80)	4.7K	5%	1/10W
R107	1-216-063-91	RES-CHIP (KV-HA21M80)	3.9K	5%	1/10W
R107	1-410-993-42	INDUCTOR (KV-HA21N70/HA21N80)	1UH		
R108	1-216-041-00	RES-CHIP (KV-HA21M80)	470	5%	1/10W
R108	1-216-295-91	SHORT (KV-HA21N70/HA21N80)	0		
R109	1-216-019-00	RES-CHIP (KV-HA21M80)	56	5%	1/10W
R111	1-216-073-91	RES-CHIP (KV-HA21M80)	10K	5%	1/10W
R112	1-216-069-00	RES-CHIP (KV-HA21M80)	6.8K	5%	1/10W
R113	1-216-057-00	RES-CHIP (KV-HA21M80)	2.2K	5%	1/10W
R114	1-216-057-00	RES-CHIP (KV-HA21M80)	2.2K	5%	1/10W
R115	1-216-065-91	RES-CHIP (KV-HA21M80)	4.7K	5%	1/10W
R117	1-216-081-00	RES-CHIP	22K	5%	1/10W
R118	1-216-041-00	RES-CHIP	470	5%	1/10W
R119	1-216-081-00	RES-CHIP	22K	5%	1/10W
R120	1-216-055-00	RES-CHIP (KV-HA21M80)	1.8K	5%	1/10W
R121	1-216-081-00	RES-CHIP (KV-HA21M80)	22K	5%	1/10W
R122	1-216-109-00	RES-CHIP (KV-HA21M80)	330K	5%	1/10W
R123	1-216-081-00	RES-CHIP (KV-HA21M80)	22K	5%	1/10W
R124	1-216-081-00	RES-CHIP	22K	5%	1/10W
R125	1-215-925-11	METAL OXIDE	22K	5%	3W
R128	1-216-025-11	RES-CHIP	100	5%	1/10W
R129	1-211-977-11	METAL CHIP	22	0.5%	1/10W
R130	1-216-049-11	RES-CHIP (KV-HA21M80)	1K	5%	1/10W
R133	1-249-389-11	CARBON	4.7	5%	1/4W
R134	1-216-295-91	SHORT	0 (KV-HA21M80)		
R134	1-216-041-00	RES-CHIP (KV-HA21N70/HA21N80)	470	5%	1/10W
R135	1-216-295-91	SHORT	0 (KV-HA21M80)		
R135	1-216-041-00	RES-CHIP (KV-HA21N70/HA21N80)	470	5%	1/10W
R200	1-216-061-91	RES-CHIP (KV-HA21M80/HA21N80)	3.3K	5%	1/10W
R200	1-216-069-00	RES-CHIP (KV-HA21N70)	6.8K	5%	1/10W
R201	1-216-053-00	RES-CHIP (KV-HA21M80)	1.5K	5%	1/10W
R201	1-216-049-11	RES-CHIP (KV-HA21N70)	1K	5%	1/10W
R201	1-216-067-00	RES-CHIP (KV-HA21N80)	5.6K	5%	1/10W
R202	1-216-089-91	RES-CHIP (KV-HA21M80)	47K	5%	1/10W
R202	1-216-081-00	RES-CHIP (KV-HA21N80)	22K	5%	1/10W
R203	1-216-041-00	RES-CHIP (KV-HA21M80)	470	5%	1/10W
R203	1-216-061-91	RES-CHIP (KV-HA21N80)	3.3K	5%	1/10W
R203	1-216-051-00	RES-CHIP (KV-HA21N70)	1.2K	5%	1/10W
R204	1-216-061-91	RES-CHIP (KV-HA21M80/HA21N80)	3.3K	5%	1/10W
R204	1-216-067-00	RES-CHIP (KV-HA21N70)	5.6K	5%	1/10W
R205	1-216-081-00	RES-CHIP (KV-HA21N80)	22K	5%	1/10W
R206	1-216-075-00	RES-CHIP (KV-HA21M80/HA21N80)	12K	5%	1/10W
R206	1-216-061-91	RES-CHIP (KV-HA21N70)	3.3K	5%	1/10W
R207	1-216-075-00	RES-CHIP (KV-HA21M80/HA21N80)	12K	5%	1/10W
R207	1-216-061-91	RES-CHIP (KV-HA21N70)	3.3K	5%	1/10W
R208	1-216-085-91	RES-CHIP (KV-HA21N70)	33K	5%	1/10W
R208	1-216-073-91	RES-CHIP (KV-HA21M80/HA21N80)	10K	5%	1/10W
R209	1-216-073-91	RES-CHIP (KV-HA21M80/HA21N80)	10K	5%	1/10W
R209	1-216-077-91	RES-CHIP (KV-HA21N70)	15K	5%	1/10W
R210	1-249-409-11	CARBON	220	5%	1/4W
R211	1-247-887-00	CARBON	220	5%	1/4W
R212	1-216-049-11	RES-CHIP	1K	5%	1/10W
R214	1-216-295-91	SHORT	0		
R215	1-216-061-91	RES-CHIP (KV-HA21M80/HA21N80)	3.3K	5%	1/10W
R216	1-216-061-91	RES-CHIP (KV-HA21M80/HA21N80)	3.3K	5%	1/10W
R217	1-216-059-00	RES-CHIP (KV-HA21M80/HA21N80)	2.7K	5%	1/10W
R218	1-216-059-00	RES-CHIP (KV-HA21M80/HA21N80)	2.7K	5%	1/10W
R219	1-216-025-11	RES-CHIP (KV-HA21M80/HA21N80)	100	5%	1/10W
R220	1-216-025-11	RES-CHIP (KV-HA21M80/HA21N80)	100	5%	1/10W
R221	1-216-025-11	RES-CHIP	100	5%	1/10W
R222	1-216-057-00	RES-CHIP	2.2K	5%	1/10W
R225	1-216-077-91	RES-CHIP (KV-HA21M80/HA21N80)	15K	5%	1/10W
R225	1-216-089-91	RES-CHIP (KV-HA21N70)	47K	5%	1/10W
R228	1-216-295-91	SHORT	0		
R229	1-216-053-00	RES-CHIP	1.5K	5%	1/10W
R230	1-216-053-00	RES-CHIP	1.5K	5%	1/10W
R231	1-216-049-11	RES-CHIP	1K	5%	1/10W
R234	1-216-113-00	RES-CHIP	470K	5%	1/10W
R235	1-216-113-00	RES-CHIP	470K	5%	1/10W
R240	1-216-077-91	RES-CHIP	15K	5%	1/10W
R241	1-216-077-91	RES-CHIP	15K	5%	1/10W
R242	1-216-073-91	RES-CHIP	10K	5%	1/10W
R243	1-216-073-91	RES-CHIP	10K	5%	1/10W
R244	1-216-113-00	RES-CHIP	470K	5%	1/10W
R248	1-216-093-91	RES-CHIP	68K	5%	1/10W
R249	1-216-049-11	RES-CHIP	1K	5%	1/10W
R300	1-216-033-00	RES-CHIP	220	5%	1/10W
R301	1-216-033-00	RES-CHIP (KV-HA21M80)	220	5%	1/10W
R302	1-216-033-00	RES-CHIP (KV-HA21M80)	220	5%	1/10W

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REF NO.	PART NO.	DESCRIPTION		REMARK	
R303	1-216-033-00	RES-CHIP	220	5%	1/10W
R304	1-216-051-00	RES-CHIP	1.2K	5%	1/10W
		(KV-HA21M80)			
R305	1-216-045-00	RES-CHIP	680	5%	1/10W
R306	1-216-039-00	RES-CHIP	390	5%	1/10W
		(KV-HA21M80)			
R307	1-216-033-00	RES-CHIP	220	5%	1/10W
		(KV-HA21M80)			
R308	1-216-027-00	RES-CHIP	120	5%	1/10W
		(KV-HA21M80)			
R309	1-216-029-00	RES-CHIP	150	5%	1/10W
		(KV-HA21M80)			
R309	1-216-041-00	RES-CHIP	470	5%	1/10W
		(KV-HA21N70/HA21N80)			
R310	1-216-039-00	RES-CHIP	390	5%	1/10W
		(KV-HA21M80)			
R311	1-216-057-00	RES-CHIP	2.2K	5%	1/10W
		(KV-HA21M80)			
R312	1-216-033-00	RES-CHIP	220	5%	1/10W
R313	1-216-037-00	RES-CHIP	330	5%	1/10W
		(KV-HA21M80)			
R314	1-216-037-00	RES-CHIP	330	5%	1/10W
		(KV-HA21M80)			
R315	1-216-081-00	RES-CHIP	22K	5%	1/10W
		(KV-HA21M80)			
R316	1-216-031-00	RES-CHIP	180	5%	1/10W
R317	1-216-041-00	RES-CHIP	470	5%	1/10W
		(KV-HA21M80)			
R318	1-216-081-00	RES-CHIP	22K	5%	1/10W
		(KV-HA21M80)			
R319	1-216-041-00	RES-CHIP	470	5%	1/10W
		(KV-HA21M80)			
R320	1-216-081-00	RES-CHIP	22K	5%	1/10W
		(KV-HA21M80)			
R323	1-216-041-00	RES-CHIP	470	5%	1/10W
		(KV-HA21M80)			
R324	1-216-041-00	RES-CHIP	470	5%	1/10W
R325	1-216-081-00	RES-CHIP	22K	5%	1/10W
R326	1-216-081-00	RES-CHIP	22K	5%	1/10W
R327	1-216-049-11	RES-CHIP	1K	5%	1/10W
R328	1-216-025-11	RES-CHIP	100	5%	1/10W
R329	1-216-043-91	RES-CHIP	560	5%	1/10W
R330	1-216-295-91	SHORT	0		
R331	1-216-295-91	SHORT	0		
R332	1-216-295-91	SHORT	0		
R333	1-216-041-00	RES-CHIP	470	5%	1/10W
R334	1-216-025-11	RES-CHIP	100	5%	1/10W
R335	1-216-025-11	RES-CHIP	100	5%	1/10W
R336	1-216-025-11	RES-CHIP	100	5%	1/10W
R337	1-216-073-91	RES-CHIP	10K	5%	1/10W
R338	1-216-077-91	RES-CHIP	15K	5%	1/10W
		(KV-HA21N70)			
R339	1-216-035-00	RES-CHIP	270	5%	1/10W
R340	1-162-974-11	CERAMIC CHIP	0.01UF		50V
R342	1-216-295-91	SHORT	0		
R345	1-216-025-11	RES-CHIP	100	5%	1/10W
R348	1-216-025-11	RES-CHIP	100	5%	1/10W
R350	1-216-039-00	RES-CHIP	390	5%	1/10W
R352	1-216-077-91	RES-CHIP	15K	5%	1/10W
		(KV-HA21N70)			
R353	1-216-119-00	RES-CHIP	820K	5%	1/10W
R354	1-216-119-00	RES-CHIP	820K	5%	1/10W
R355	1-216-061-91	RES-CHIP	3.3K	5%	1/10W

REF NO.	PART NO.	DESCRIPTION		REMARK	
R356	1-216-061-91	RES-CHIP	3.3K	5%	1/10W
		(KV-HA21M80/HA21N80)			
R356	1-216-045-00	RES-CHIP	680	5%	1/10W
		(KV-HA21N70)			
R357	1-216-101-00	RES-CHIP	150K	5%	1/10W
R358	1-216-025-11	RES-CHIP	100	5%	1/10W
R360	1-216-065-91	RES-CHIP	4.7K	5%	1/10W
R361	1-216-033-00	RES-CHIP	220	5%	1/10W
R362	1-216-083-00	RES-CHIP	27K	5%	1/10W
R363	1-216-295-91	SHORT	0		
R364	1-216-077-91	RES-CHIP	15K	5%	1/10W
R365	1-216-295-91	SHORT	0		
R367	1-216-099-00	RES-CHIP	120K	5%	1/10W
R368	1-216-049-11	RES-CHIP	1K	5%	1/10W
R369	1-216-123-11	RES-CHIP	1.2M	5%	1/10W
R370	1-216-083-00	RES-CHIP	27K	5%	1/10W
R371	1-208-820-11	METAL CHIP	39K	0.5%	1/10W
R374	1-216-057-00	RES-CHIP	2.2K	5%	1/10W
R376	1-216-295-91	SHORT	0		
R389	1-216-109-00	RES-CHIP	330K	5%	1/10W
R392	1-216-069-00	RES-CHIP	6.8K	5%	1/10W
R393	1-216-295-91	SHORT	0		
		(KV-HA21M80/HA21N80)			
R393	1-216-049-11	RES-CHIP	1K	5%	1/10W
		(KV-HA21N70)			
R394	1-247-852-11	CARBON	7.5K	5%	1/4W
		(KV-HA21N70/HA21N80)			
R400	1-216-295-91	SHORT	0		
R401	1-216-049-11	RES-CHIP	1K	5%	1/10W
R402	1-216-025-11	RES-CHIP	100	5%	1/10W
		(KV-HA21M80/HA21N80)			
R403	1-216-073-91	RES-CHIP	10K	5%	1/10W
		(KV-HA21M80/HA21N80)			
R404	1-216-049-11	RES-CHIP	1K	5%	1/10W
		(KV-HA21M80/HA21N80)			
R405	1-216-073-91	RES-CHIP	10K	5%	1/10W
		(KV-HA21M80/HA21N80)			
R406	1-216-113-00	RES-CHIP	470K	5%	1/10W
		(KV-HA21M80/HA21N80)			
R407	1-216-049-11	RES-CHIP	1K	5%	1/10W
		(KV-HA21M80/HA21N80)			
R408	1-216-049-11	RES-CHIP	1K	5%	1/10W
		(KV-HA21M80/HA21N80)			
R409	1-216-113-00	RES-CHIP	470K	5%	1/10W
R410	1-216-025-11	RES-CHIP	100	5%	1/10W
R411	1-216-049-11	RES-CHIP	1K	5%	1/10W
R412	1-216-049-11	RES-CHIP	1K	5%	1/10W
R413	1-216-113-00	RES-CHIP	470K	5%	1/10W
R414	1-216-049-11	RES-CHIP	1K	5%	1/10W
R415	1-216-073-91	RES-CHIP	10K	5%	1/10W
R416	1-216-073-91	RES-CHIP	10K	5%	1/10W
R417	1-216-021-00	RES-CHIP	68	5%	1/10W
R418	1-216-025-11	RES-CHIP	100	5%	1/10W
R419	1-208-820-11	METAL CHIP	39K	0.5%	1/10W
		(KV-HA21M80/HA21N80)			
R420	1-216-049-11	RES-CHIP	1K	5%	1/10W
R421	1-216-049-11	RES-CHIP	1K	5%	1/10W
R422	1-216-091-00	RES-CHIP	56K	5%	1/10W
		(KV-HA21M80/HA21N80)			
R423	1-208-820-11	METAL CHIP	39K	0.5%	1/10W
R424	1-216-091-00	RES-CHIP	56K	5%	1/10W
R425	1-216-022-00	RES-CHIP	75	5%	1/10W
R426	1-216-049-11	RES-CHIP	1K	5%	1/10W

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

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REF NO.	PART NO.	DESCRIPTION		REMARK	
R427	1-216-051-00	RES-CHIP	1.2K	5%	1/10W
R428	1-216-041-00	RES-CHIP	470	5%	1/10W
R429	1-216-073-91	RES-CHIP	10K	5%	1/10W
R430	1-216-063-91	RES-CHIP	3.9K	5%	1/10W
R431	1-216-091-00	RES-CHIP (KV-HA21M80/HA21N80)	56K	5%	1/10W
R432	1-216-121-11	RES-CHIP	1M	5%	1/10W
R433	1-216-091-00	RES-CHIP	56K	5%	1/10W
R434	1-216-049-11	RES-CHIP	1K	5%	1/10W
R435	1-216-121-11	RES-CHIP (KV-HA21M80/HA21N80)	1M	5%	1/10W
R436	1-216-022-00	RES-CHIP	75	5%	1/10W
R438	1-216-049-11	RES-CHIP	1K	5%	1/10W
R440	1-216-121-11	RES-CHIP	1M	5%	1/10W
R443	1-216-121-11	RES-CHIP (KV-HA21M80/HA21N80)	1M	5%	1/10W
R445	1-216-089-91	RES-CHIP	47K	5%	1/10W
R446	1-216-089-91	RES-CHIP (KV-HA21M80/HA21N80)	47K	5%	1/10W
R447	1-216-025-11	RES-CHIP (KV-HA21N70)	100	5%	1/10W
R500	1-260-126-81	CARBON	180K	5%	1/2W
R501	1-249-419-11	CARBON	1.5K	5%	1/4W
R502	1-216-370-11	METAL OXIDE	1.2	5%	2W
R503	1-216-091-00	RES-CHIP	56K	5%	1/10W
R504	1-216-091-00	RES-CHIP	56K	5%	1/10W
R505	1-216-065-91	RES-CHIP	4.7K	5%	1/10W
R506	1-260-125-11	CARBON	150K	5%	1/2W
R507	1-260-288-11	CARBON	0.47	5%	1/2W
R508	1-260-288-11	CARBON	0.47	5%	1/2W
R509	1-260-288-11	CARBON	0.47	5%	1/2W
R510	1-249-409-11	CARBON	220K	5%	1/2W
R511	1-215-449-00	METAL	15K	1%	1/4W
R512	1-215-453-00	METAL (KV-HA21M80)	22K	1%	0.25W
R512	1-215-453-00	METAL (KV-HA21N70/HA21N80)	22K	1%	1/4W
R513	1-215-445-00	METAL (KV-HA21M80)	10K	1%	0.25W
R513	1-215-445-00	METAL (KV-HA21N70/HA21N80)	10K	1%	1/4W
R514	1-249-385-11	CARBON	2.2K	5%	1/4W
R553	1-249-385-11	CARBON	2.2	5%	1/4W
R554	1-216-057-00	RES-CHIP	2.2K	5%	1/10W
R557	1-216-655-11	METAL CHIP	1.5K	0.5%	1/10W
R558	1-216-081-00	RES-CHIP	22K	5%	1/10W
R559	1-216-089-91	RES-CHIP	47K	5%	1/10W
R563	1-216-655-11	METAL CHIP	1.5K	0.5%	1/10W
R564	1-215-865-11	METAL OXIDE	220	5%	1W
R565	1-216-350-11	METAL OXIDE	1.2	5%	1W
R567	1-208-790-11	METAL CHIP	2.2K	0.5%	1/10W
R568	1-215-461-00	METAL (KV-HA21M80)	47K	1%	0.25W
R568	1-215-461-00	METAL (KV-HA21N70/HA21N80)	47K	1%	1/4W
R600	1-215-915-11	METAL OXIDE	470	5%	3W
R602	1-240-262-11	CEMENTED	0.68	5%	10W
R603	1-240-262-11	CEMENTED	0.68	5%	10W
R605	1-217-191-21	METAL	0.18	10%	2W
R606	1-216-045-00	RES-CHIP	680	5%	1/10W
R608	1-260-127-11	CARBON	220K	5%	1/2W
R609	1-216-091-00	RES-CHIP	56K	5%	1/10W
R610	1-215-926-00	METAL OXIDE	33K	5%	3W
R611	1-216-067-00	RES-CHIP	5.6K	5%	1/10W

REF NO.	PART NO.	DESCRIPTION		REMARK	
R612	1-249-420-11	CARBON	1.8K	5%	1/4W
R615	1-215-877-11	METAL OXIDE	22K	5%	1W
R617	1-216-049-11	RES-CHIP	1K	5%	1/10W
R619	⚠ 1-240-917-11	METAL	8.2M	5%	1W
R620	1-249-389-11	CARBON	4.7	5%	1/4W
R623	1-216-053-00	RES-CHIP	1.5K	5%	1/10W
R624	1-260-126-81	CARBON	180K	5%	1/2W
R627	1-240-262-11	CEMENTED	0.68	5%	10W
R800	1-216-049-11	RES-CHIP	1K	5%	1/10W
R801	1-216-081-00	RES-CHIP	22K	5%	1/10W
R802	1-215-917-11	METAL OXIDE	1K	5%	3W
R803	1-260-332-51	CARBON	2.2K	5%	1/2W
R806	1-216-295-91	SHORT	0		
R808	1-249-385-11	CARBON	2.2K	5%	1/4W
R810	1-215-886-11	METAL OXIDE	100	5%	2W
R811	1-215-911-11	METAL OXIDE	100	5%	3W
R812	1-215-917-11	METAL OXIDE	1K	5%	3W
R813	1-216-049-11	RES-CHIP	1K	5%	1/10W
R814	1-215-917-11	METAL OXIDE	1K	5%	3W
R860	1-216-103-00	RES-CHIP	180K	5%	1/10W
R861	1-216-295-91	SHORT	0		
R862	1-216-057-00	RES-CHIP	2.2K	5%	1/10W
R863	1-216-073-91	RES-CHIP	10K	5%	1/10W
R864	1-208-794-11	METAL CHIP	3.3K	0.5%	1/10W
R865	1-216-073-91	RES-CHIP	10K	5%	1/10W
R866	1-216-049-11	RES-CHIP	1K	5%	1/10W
R867	1-208-812-11	METAL CHIP	18K	0.5%	1/10W
R868	1-249-393-11	CARBON	10	5%	1/4W
R869	1-249-381-11	CARBON	1	5%	1/4W
R870	1-218-760-11	METAL CHIP	220K	0.5%	1/10W
R874	1-215-475-00	METAL	180K	1%	1/4W
R878	1-216-049-11	RES-CHIP	1K	5%	1/10W
R879	1-216-057-00	RES-CHIP	2.2K	5%	1/10W
R880	1-216-097-11	RES-CHIP	100K	5%	1/10W
R881	1-216-085-91	RES-CHIP	33K	5%	1/10W
R882	1-216-073-91	RES-CHIP	10K	5%	1/10W
R883	1-216-067-00	RES-CHIP	5.6K	5%	1/10W
R884	1-216-089-91	RES-CHIP	47K	5%	1/10W
R885	1-216-073-91	RES-CHIP	10K	5%	1/10W
R886	1-216-295-91	SHORT	0		
R887	1-215-477-00	METAL (KV-HA21M80)	220K	1%	0.25W
R887	1-215-477-00	METAL (KV-HA21N70/HA21N80)	220K	1%	1/4W
R888	1-215-477-00	METAL (KV-HA21M80)	220K	1%	0.25W
R888	1-215-477-00	METAL (KV-HA21N70/HA21N80)	220K	1%	1/4W
R889	1-208-830-11	METAL CHIP	100K	0.5%	1/10W
		<VARIABLE RESISTOR>			
RV300	1-241-769-11	RES, ADJ, CARBON 470K			
		<SWITCH>			
S001	1-692-431-21	SWITCH, TACTILE			
S002	1-692-431-21	SWITCH, TACTILE			
S003	1-692-431-21	SWITCH, TACTILE			
S004	1-692-431-21	SWITCH, TACTILE			
S005	1-692-431-21	SWITCH, TACTILE			

The components identified by shading and mark ⚠ are critical for safety.
Replace only with part number specified.

A CV

REF NO.		PART NO.	DESCRIPTION	REMARK
S006		1-692-431-21	SWITCH, TACTILE	
S600	⚠	1-571-433-31	SWITCH, PUSH (AC POWER)	
S800		1-572-707-11	SWITCH, LEVER	
			<#########>	
SWF100		1-781-042-11	FILTER, SURFACE WAVE	
			<TRANSFORMER>	
T503	⚠	1-453-329-21	TRANSFORMER ASSY FLY BACK (NX-4751//M3A4)	
T600		1-431-747-11	TRANSFORMER, LINE FILTER	
T601		1-437-333-21	TRANSFORMER, CONVERTER (SRT)	
T800		1-435-374-11	TRANSFORMER, FERRITE (HDT)	
			<THERMISTOR>	
THP600		1-803-744-11	THERMISTOR, POSITIVE	
			<TUNER>	
TU100		8-598-591-10	TUNER, VSS BT-AG402 (KV-HA21M80)	
TU100		8-598-590-00	TUNER, FSS BTP-AA401 (KV-HA21N70/HA21N80)	
			<VARISTOR>	
VDR600		1-803-830-31	VARISTOR (ERZV14D621)	
			<CRYSTAL>	
X001		1-577-358-21	VIBRATOR, CERAMIC	
X300		1-567-505-11	OSCILLATOR, CRYSTAL	
X301		1-567-504-11	OSCILLATOR, CRYSTAL	

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	*	A-1332-270-A	CV BOARD MOUNTED (KV-HA21M80)
	*	A-1332-200-A	CV BOARD MOUNTED (KV-HA21N70/HA21N80)
			**********
		4-382-854-01	SCREW (M3X8), P, SW (+)
			<CAPACITOR>

C701	1-115-350-51	CERAMIC	0.0047UF		2KV
C702	1-102-074-00	CERAMIC	0.001UF	10.00%	50V
C703	1-107-651-11	ELECT	4.7UF	20.00%	250V
C704	1-130-202-00	FILM	0.022UF	5.00%	400V
C706	1-125-796-91	ELECT	47UF	20.00%	16V
C708	1-102-114-00	CERAMIC	470PF	10.00%	50V
C709	1-102-114-00	CERAMIC	470PF	10.00%	50V
C710	1-102-114-00	CERAMIC	470PF	10.00%	50V
C712	1-102-114-00	CERAMIC	470PF	10.00%	50V
C713	1-102-115-00	CERAMIC	560PF	10.00%	50V
C714	1-102-115-00	CERAMIC	560PF	10.00%	50V
C716	1-126-933-11	ELECT	100UF	20.00%	16V
C717	1-102-852-91	CERAMIC	47PF	5.00%	50V
C718	1-126-933-11	ELECT	100UF	20.00%	16V
C719	1-102-116-00	CERAMIC	680PF	10.00%	50V

REF NO.		PART NO.	DESCRIPTION	REMARK
			<#########>	
CLP701	*	4-042-408-01	PIN, COATING LEAD	
CLP702	*	4-042-408-01	PIN, COATING LEAD	
CLP703	*	4-042-408-01	PIN, COATING LEAD	
CLP704	*	4-042-408-01	PIN, COATING LEAD	
			<CONNECTOR>	
CN701	*	1-564-508-11	PLUG, CONNECTOR 5P	
CN702		1-695-915-11	TAB (CONTACT)	
CN703		1-564-509-11	PLUG, CONNECTOR 6P	
CN704		1-695-915-11	TAB (CONTACT)	
			<DIODE>	
D701		8-719-911-19	1SS119-25	
D702		8-719-911-19	1SS119-25	
D703		8-719-911-19	1SS119-25	
D707		8-719-911-19	1SS119-25	
D708		8-719-911-19	1SS119-25	
D709		8-719-911-19	1SS119-25	
D713		8-719-911-19	1SS119-25	
D714		8-719-911-19	1SS119-25	
D715		8-719-911-19	1SS119-25	
D716		8-719-911-19	1SS119-25	
D717		8-719-070-16	NNCD9.1A-T1	
			<JACK>	
J701	⚠	1-540-071-22	SOCKET, CRT	
			<COIL>	
L701		1-414-185-41	INDUCTOR 22UH	
L710		1-414-183-41	INDUCTOR 10UH	
			<TRANSISTOR>	
Q704		8-729-326-11	2SC2611	
Q705		8-729-326-11	2SC2611	
Q706		8-729-326-11	2SC2611	
Q707		8-729-200-17	2SA1091-O	
Q708		8-729-200-17	2SA1091-O	
Q709		8-729-200-17	2SA1091-O	
Q710		8-729-119-78	2SC2785-HFE	
Q711		8-729-119-78	2SC2785-HFE	
Q712		8-729-119-78	2SC2785-HFE	
			<RESISTOR>	

R703	1-219-752-11	CARBON	100K	5%	1/2W
R706	1-215-417-00	METAL (KV-HA21M80)	680	1%	0.25W
R706	1-215-417-00	METAL (KV-HA21N70/HA21N80)	680	1%	1/4W
R707	1-215-413-00	METAL (KV-HA21M80)	470	1%	0.25W
R707	1-215-413-00	METAL (KV-HA21N70/HA21N80)	470	1%	1/4W
R708	1-216-387-11	METAL OXIDE	0.68	5%	3W
R710	1-216-486-00	METAL OXIDE	8.2K	5%	3W
R711	1-260-330-11	CARBON	1.5K	5%	1/2W

CV

REF NO.	PART NO.	DESCRIPTION		REMARK	
R712	1-216-486-00	METAL OXIDE	8.2K	5%	3W
R713	1-260-330-11	CARBON	1.5K	5%	1/2W
R714	1-216-486-00	METAL OXIDE	8.2K	5%	3W
R715	1-260-330-11	CARBON	1.5K	5%	1/2W
R716	1-249-923-11	CARBON	1K	5%	1/4W
R717	1-249-923-11	CARBON	1K	5%	1/4W
R718	1-249-923-11	CARBON	1K	5%	1/4W
R725	1-249-385-11	CARBON	2.2K	5%	1/4W
R726	1-249-385-11	CARBON	2.2K	5%	1/4W
R727	1-249-385-11	CARBON	2.2K	5%	1/4W
R728	1-247-885-00	CARBON	180	5%	1/4W
R729	1-247-885-00	CARBON	180	5%	1/4W
R730	1-247-885-00	CARBON	180	5%	1/4W
R731	1-247-883-00	CARBON	150	5%	1/4W
R732	1-247-883-00	CARBON	150	5%	1/4W
R733	1-247-883-00	CARBON	150	5%	1/4W
R734	1-219-743-11	CARBON	100	5%	1/2W
R738	1-249-441-11	CARBON	100	5%	1/4W
R739	1-249-441-11	CARBON	100	5%	1/4W
R740	1-249-441-11	CARBON	100	5%	1/4W
R755	1-249-382-11	CARBON	1.2K	5%	1/4W
R756	1-249-382-11	CARBON	1.2K	5%	1/4W
R757	1-249-382-11	CARBON	1.2K	5%	1/4W

<VARIABLE RESISTOR>

RV702	1-241-656-11	RES, ADJ, METAL FILM 110M

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REF NO.	PART NO.	DESCRIPTION	REMARK
		ACCESSORIES AND PACKING MATERIALS	
		**********	
	1-501-372-81	ANTENNA, TELESCOPIC	
	1-417-170-11	MATCHING TRANSFORMER, ANTENNA (KV-HA21N70/HA21N80)	
	3-701-910-00	SCREW, SPECIAL (DIA. 3.8X20)	
*	4-053-003-01	BAG, PROTECTION (KV-HA21M80)	
*	4-039-372-01	BAG, PROTECTION (KV-HA21N70/HA21N80)	
*	4-087-199-01	CUSHION, UPPER (KV-HA21M80)	
*	4-087-200-01	CUSHION, LOWER (KV-HA21M80)	
*	4-085-463-01	CUSHION, LOWER (KV-HA21N70/HA21N80)	
*	4-085-464-01	CUSHION, UPPER (KV-HA21N70/HA21N80)	
*	4-087-201-01	INDIVIDUAL CARTON (KV-HA21M80)	
*	4-086-777-01	INDIVIDUAL CARTON (KV-HA21N70/HA21N80)	
	4-087-198-11	MANUAL, INSTRUCTION (KV-HA21M80)	
	4-086-776-11	MANUAL, INSTRUCTION (KV-HA21N70/HA21N80)	
	4-392-003-31	BAND, HOLD (KV-HA21M80)	
	4-392-003-11	BAND, HOLD (KV-HA21N70/HA21N80)	
	4-392-004-21	CLIP (KV-HA21M80)	
	4-392-004-11	CLIP (KV-HA21N70/HA21N80)	

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BATTERY COVER REMOTE COMMANDER
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1-477-162-11	REMOTE COMMANDER (RM-968) (KV-HA21N70/HA21N80)	
4-084-290-01	BATTERY COVER REMOTE COMMANDER(RM-968)	
1-477-047-11	REMOTE COMMANDER (RM-969) (KV-HA21M80)	
4-084-290-01	BATTERY COVER REMOTE COMMANDER(RM-969)	

Sony Corporation
Sony Technology Malaysia Sdn. Bhd.
Visual Products General Area

9-872-280-01

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